PELLAGRA NUMBER

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ORIGINAL ARTICLES

Pellagra in Tennessee. By J. A. Albright, M.D., Nashville, Tenn. 69-72

The Etiology of Pellagra. By Jno. L. Jelks, M.D., Memphis, Tenn. 72-75

Pathology of Pellagra. By H. F. Harris, M.D., Atlanta, Ga. 75-83

Pseudo-Pellagra. By C. H. Lavinder, M.D., U. S. Public Health and Marine Hospital Service..... 83-87

A Cursory Study of the Skin Manifestations of Pellagra. By H. E. Menage, M.D., New Orleans, La.... 88-89

A Discussion of the Symptom Complex Called Pellagra. By J. S. Turbeville, M.D., Century, Fla..... 90-93

Treatment of Pellagra. By John A. Kimbrough, M.D., Thomasville, Ala. 93-101

Treatment of Pellagra. By Louis Leroy, M.D., Memphis, Tenn. 101-105

The Prognosis of Pellagra. By C. C. Bass, M.D., New Orleans, La. 106-107

Observations on Pellagra in Italy. By Herbert P. Cole, M.D., Mobile, Ala. 107-109

Wherein Diagnosis of Pellagra Is of Surgical Importance. By LeGrand Guerry, M.D., Columbia, S. C. 109-112

Pellagra—A Sociologic and Therapeutic Study. By Geo. M. Niles, M.D., Atlanta, Ga. 112-116

Are the Jews Immune to Pellagra. By Bernard Wolff, M.D., Atlanta, Ga. 116-124

Some Observations on Pellagra. By W. C. Brownson, M.D., Asheville, N. C. 125-129

Discussion on the Symposium of Pellagra 129-134

Editorial 135-139

Book Reviews 140-141

Therapeutics 141-142

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See Page 9

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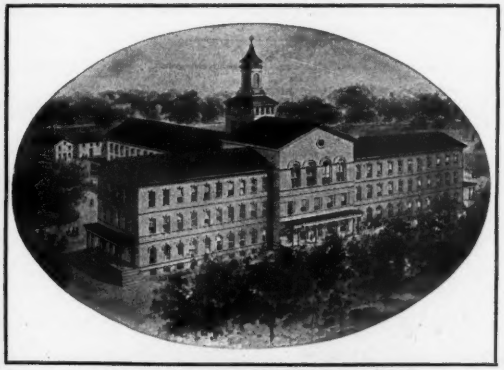

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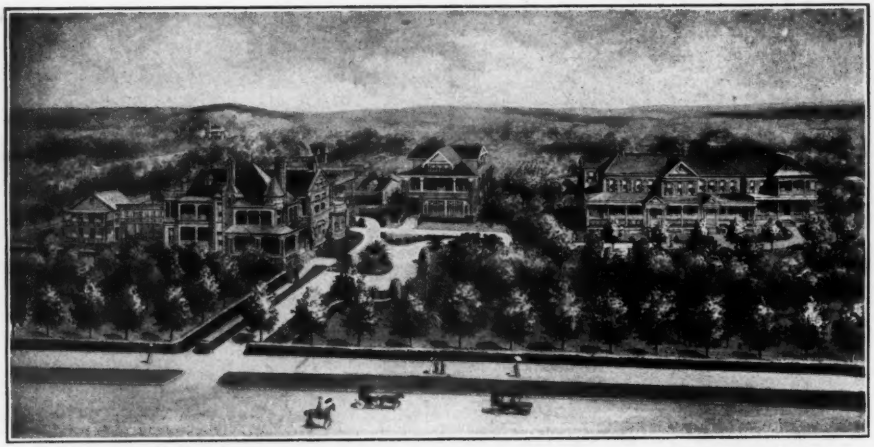

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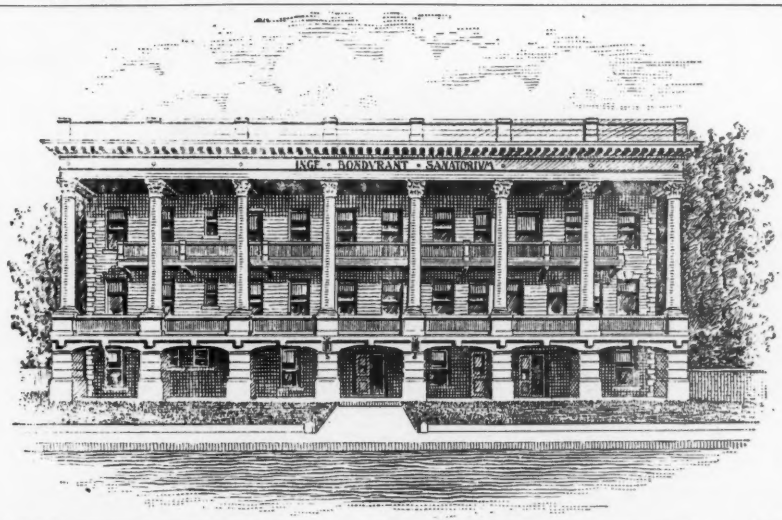

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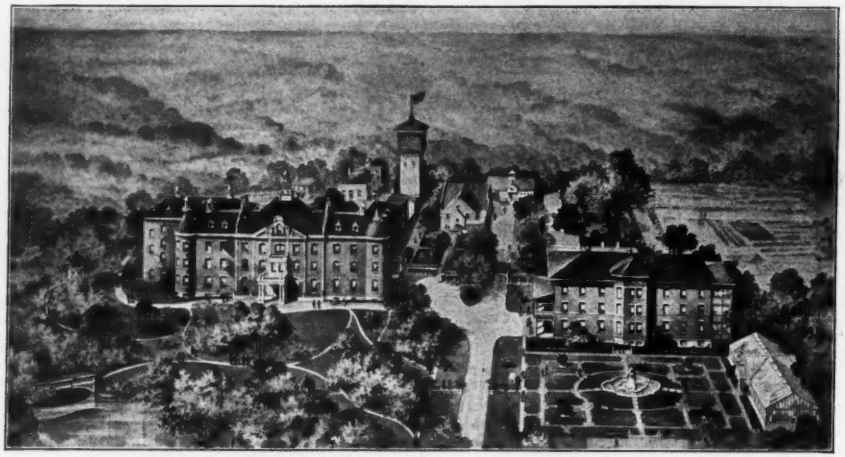

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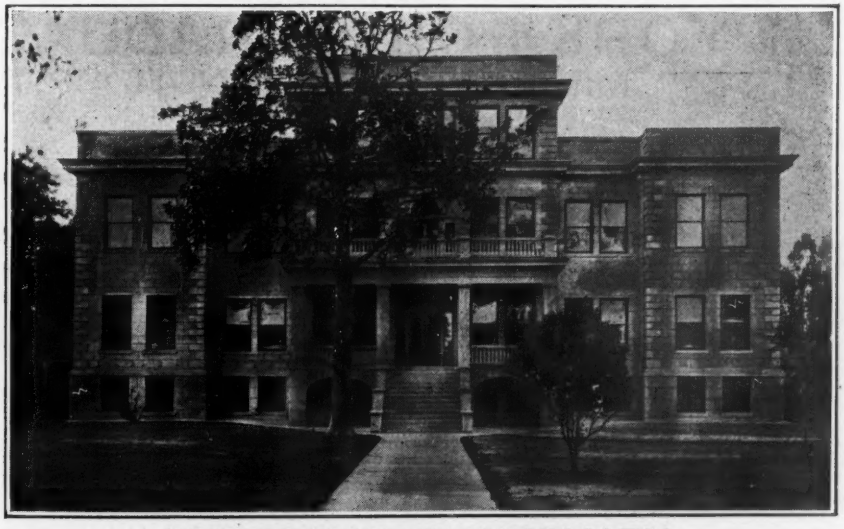

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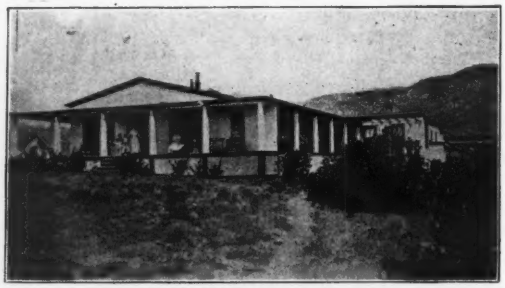

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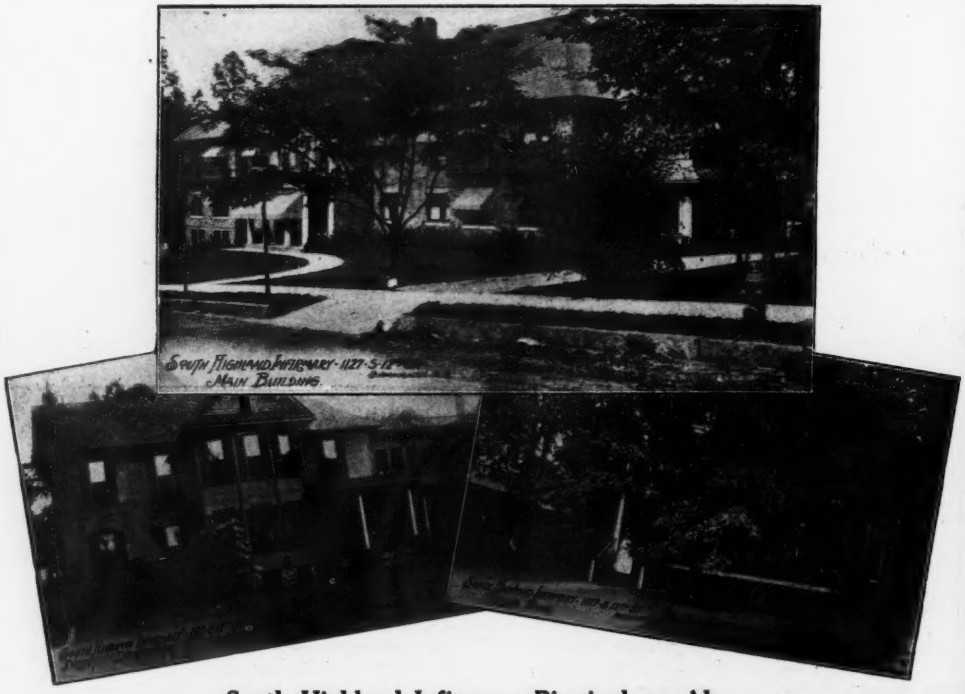

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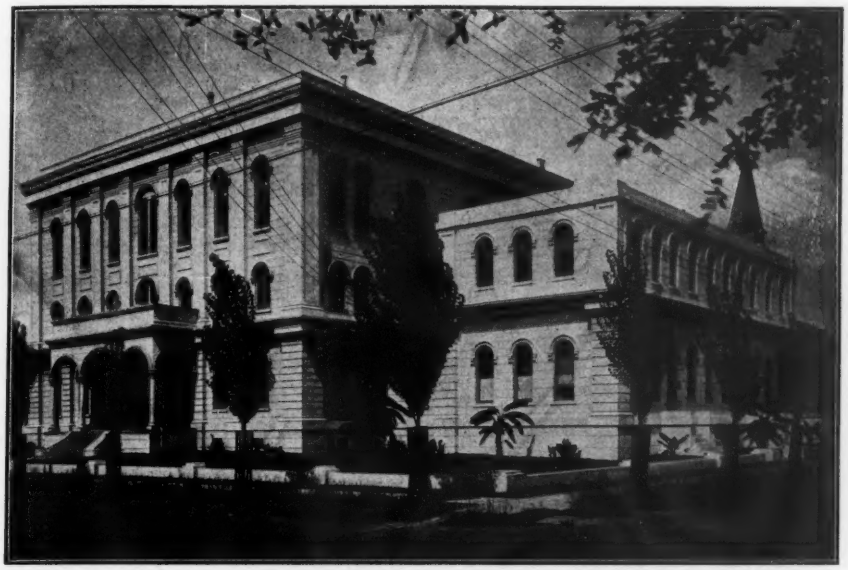

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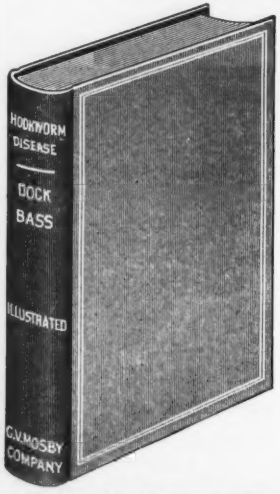

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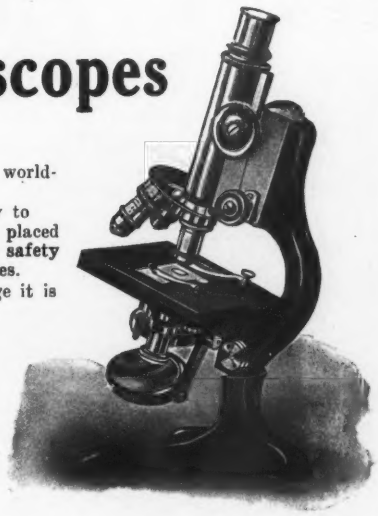

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ORIGINAL ARTICLES

PELLAGRA IN TENNESSEE.*

By J. A. ALBRIGHT, M.D.,
Nashville, Tenn.

Pellagra was first discovered in Tennessee in June, 1909, at the Baptist Orphanage Asylum, located at Nashville, Tenn. The diagnosis was made by Dr. J. M. King, and afterwards confirmed by Past Assistant Surgeon C. H. Lavinder, of the Marine Hospital Service. This outbreak consisted of seventeen cases, three of which proved fatal, and the other fourteen cases under treatment of Dr. B. G. Luckett, County Health Officer of Davidson County, have entirely recovered.

This same year the disease was recognized at half a dozen other places in the State, and was accompanied by an unusually large percentage of deaths. Only one patient developed the disease during 1909 at either of the insane asylums. During the year of 1910 about one hundred cases developed within the State. Early this year the disease assumed rapid development throughout the entire State; in fact, the outbreak was so unusually widespread as to create uneasiness and alarm in the great number of communities in which it occurred. Appeals from the various communities to the State Board of Health for assistance and relief became so frequent that it placed in the field, on August 1, three eminent physicians to assist the local doctors in making an early diagnosis, and to institute and inaugurate a campaign of education that would cause the recognition of all pellagrous cases at the beginning of the attack, which, of course, would result in the favorable termination of a large per cent of cases. These physicians remained in the field for a period of two months, visiting sixty-four counties, submitting to me daily reports of cases seen. According to a list of questions, furnished on page 15 of their report, and from a report of 316 cases actually seen and reported, they submitted to the State Board of Health of Tennessee their final report, together with their conclusions thereon.

As this report has just come off the press, and has never been given to the public, I submit a copy of the same with this paper.

DETAILED REPORT.

Number of counties in the State	96
Number of counties visited	64
Number of counties found with pellagra	58
Number of counties with pellagra not visited	9
Total number of counties with pellagra	67
Number of detailed reports on file	316

We have prepared a map indicating approximately the location of cases in the State. We think that the greater number of cases in the cities represent merely cases that have been brought there for treatment.

These detailed reports have been tabulated to show the total number of cases; the number of male whites; females whites; male colored; female colored; the occupation, duration of disease; other diseases complicating pellagra; previous state of health; hygienic surroundings; hygiene of dwellings; presence or absence of screens; kind of water supply; proximity to creeks; presence or absence of stinging insects; other cases of pellagra in

*Read before the Southern Medical Association at Hattiesburg, Miss., Nov. 11-14, 1911.

family; relation to corn meal and cooking oil and the probable prognosis, as shown by the following table:

Total Cases	316
Male whites	98
Female whites	200
Male colored	4
Female colored	14
Occupations—	
Housewives	141
None	30
Miners	9
Laborers	29
School girls	22
Farmers	32
School boys	12
Washerwoman	1
Paupers	1
Cooks	1
Miscellaneous	38
Social State—	
Married	204
Single	92
Widowed	20
Exposure to Pellagra—	
Exposed	107
Not exposed	109
Prodromal State—	
Yes	189
No	127
Change of Residence—	
Yes	110
No	206
Duration of Disease—	
To 1 year	160
To 2 years	67
To 3 years	34
To 4 years	13
To 5 years	6
To 6 years	2
To 7 years	3
To 8 years	7
To 10 years	1
To 11 years	3
To 15 years	1
Unknown	19
Other Diseases Complicating—	
Hookworm	10
Tuberculosis	18
Mental	4
Age	8
Invalid	4
None	186
Syphilis	6
Thyroid Disease	25
Indigestion	4
Epilepsy	3
Alcoholism	2
Other diseases	46
Previous Health—	
Good	158
Fair	53
Poor	85
Bad	16
Doubtful	4
Hygienic Surroundings—	
Good	26
Fair	100
Poor	91
Bad	96
Unknown	3
Hygiene of Dwellings—	
Good	31
Fair	95
Poor	97
Bad	93
Screened—	
Yes	69
No	147
Water Supply—	
City	70
Dug wells	163
Cisterns	31
Springs	48
Unknown	4
Proximity to Creeks—	
Yes	78
Not observed	141
No	97
Insects—	
Mosquitoes	223
Gnats	223
Bed bugs	196
Flies and fleas	All
Others in Family with Pellagra—	
Yes	58
Foods—	
Corn meal	307
No corn meal	9
Unknown	..
Kinds of Products—	
Store	283
Own	30
Unknown	3
Cooking Oils—	
Lard	37
Cotton	216
Unknown	19
Prognosis—	
Good	151
Fair	7
Poor	2
Bad	81
Doubtful	63
Recovery	2
Deaths	10

We beg to submit the following conclusions for the consideration of the Board, which conclusions are offered tentatively as only representing the apparent situation as we understand it after making the report and without prolonged deliberation on the subject.

1. The data gathered in the field show that first cases, as a rule, spring up in the most remote places. While some of these have been imported from other States, quite as many give no history or exposure to any person or place infected with pellagra.

2. The disease has appeared rather simultaneously at widely different points—not in any way related to each other, either as to avenue of infection or as to similarity of local conditions.

3. The epidemic of pellagra in the United States has appeared in disregard of all laws of epidemiology. There has been no route of travel or sequence of development characteristic of infectious diseases.

4. While first cases may appear in disregard of any system or regularity, a large number of cases have apparently become foci for the development of secondary cases.

5. Such secondary appearance fails to sustain either view of the etiology of the disease to the exclusion of the other. Such exposed persons may partake of the infected or poisonous food, contract the disease through the bite of an insect, or may become contaminated in some other way.

6. In some counties there is as yet no evidence of secondary cases, for in one instance the first case appeared seven years ago, and this patient is now living on the bank of a stream.

7. Approximately 97 per cent of cases admit the use of corn meal in some form, and, while many are tempted to mislead, there seem to be authentic cases of abstention from corn in all its forms. No case is reported of the complete absence of corn meal from the premises for a term of years.

8. The prodromal stage, or period of incubation, seems to vary greatly, but is apparently quite long. The development of the disease appears in all cases to be gradual. While diagnostic symptoms may appear spontaneously, they must follow a progressive disease of the spinal cord.

9. A large proportion of cases appear in the wake of or in the course of some other disease.

10. While this is a disease of poverty and bad hygiene, many cases have appeared in well-to-do families with good hygienic surroundings.

11. Arsenic, especially the arylarsonates, appears to have a specific curative effect when begun early and persisted in.

12. Failure to seek medical relief and especially the persistence in bad hygiene and food usually results in death or insanity sooner or later.

13. The amelioration or disappearance of symptoms in cold weather suggests a strong climatic influence upon the course of the disease.

14. Pellagra appears to be a gradually developing, cumulative intoxication of the central nervous system, of indefinite prodromal stage, of seasonal periodicity, the symptoms of which may appear suddenly during the spring, summer or early autumn.

15. There is no proof of its immediate transmission from person to person, though it may be a house infection.

16. Its phenomena can be explained on grounds other than infectiousness, and they appear to favor the hypothesis of food transmission. The theory of insect transmission does not fit the early isolated cases so frequently found.

17. It is possible that food cereals, and especially corn meal, serve as vehicles of transmission, and that the infection exists in granaries and elevators and that the obstacles to its transmission in this way are great enough to account for the relatively few cases of the disease.

18. Since this possibility has not been definitely disproved, it is imperative that there be sanitary supervision of grain distirbution.

19. It is imperative that the public be instructed in hygienic living with special reference to house screening, sanitary privies, prop-

erly cooked, wholesome food—eaten as soon as prepared—and that medical advice be sought on the appearance of the earliest suspicious symptoms.

20. We need institutions for the care, treatment and study of pellagrins.

It appears to the undersigned that the work thus far acocmplished only serves to point the way for further investigation in the hope that the etiology of the disease may be definitely established and its amelioration and eradication assured.

Respectfully submitted,

WILLIAM KRAUSS,,
Chairman.
BYRD L. RHEA,
J. C. BROOKS.

THE ETIOLOGY OF PELLAGRA.*

By JNO. L. JELKS, M.D.,
President of the American Proctologic Society, President of the Cotton Belt Surgeons' Association, Memphis, Tenn.

For several years I have observed skin manifestations among patients suffering infections and ulcerations of the large bowel, and in April, 1901, I read my first paper, in which I referred to this complication of amebiasis. Again, in May, 1909, I referred to these manifestations in a paper read before the Arkansas State Society.

In the first part of April, 1910, I read a paper before the Tennessee State Society, in which I referred to the very probable relationship between amebiasis and pellagra, and reported a number of cases of amebiasis in which I had observed skin manifestations of varying character and severity, and there presented a case of amebiasis which had been diagnosed by a number of clinicians as pellagra. Then, and also before the American Proctologic Society, of the same year, I referred to the fact that relief of these skin manifestations in most cases was readily secured by treatment directed to intestinal infection and ulceration. Up to that time no other writer had, to my knowledge, alluded to these symptoms or complications.

These symptoms or manifestations observed were so varied in degree, as also in character, that special mention was made of their character and extent in my papers. Some of these skin symptoms were simple staphylococcic pustules, others were urticarial, others were erythematous, some were edematous, and one patient had died of an extensive desquamative dermatitis. Some of these gentlemen present at this meeting can recall to their minds the most beautiful case of pellagra I presented at the April, 1910, meeting of the Tennessee State Society, and what I had to say concerning my belief of an etiologic relationship existing between the dermal symptoms and the amebic infection, and ulceration which had been found to exist in the intestines of that case. I wished for assistance along this line of thought and investigation, for I sincerely believed then, as I do now, that pellagra describes a series of symptoms, complex, dependent, primarily, upon an intestinal parasitisis.

I have continued these investigations in a quiet way, as my private work only affords, and single-handed, except I may say, through the original work done in the study of pathology in the spinal nerve roots done by a Dr. Long, who, by some writers, is given credit for the theory I had advanced at least a year before. Dr. Long's study of the nerve root

* Read before the Southern Medical Association at Hattiesburg, Miss., Nov. 11-14, 1911.

pathology greatly strengthens this theory, however, yet I fear he has advanced too far, perhaps misconstrued the literature I had sent to him when he was on the Pacific Coast, in 1909.

I have seen striking pellagra symptoms in those in whom no amebae were found, but in which tuberculosis of the intestines was found. In at least two cases examined by me I have observed myiasis and amebiasis.

In a few of my cases I have been unable to isolate any motile pathogenic intestinal parasite, though all cases exhibited a pathology so striking that even before skin symptoms were manifested I have anticipated and forewarned the attending physicians. In at least three cases my rectal and microscopical examinations have enabled me to thus picture the future outcome in their cases for Dr. Rucker. Dr. Crutcher and Dr. E. C. Mitchell. In the cases examined for the last named two gentlemen both were infants two years old. In neither of these three cases had I observed skin lesions, which appeared later. The same is true in one of my cases, as during the course of treatment for amebiasis the dermal symptoms appeared.

Another fact relative to amebic infection of the gut is that, though present, it may not be found, or the amebae may be encysted or contracted and immotile. The amebae may have been present primarily, yet not so at some later time, when the skin and nervous symptoms referred to are present. The endoplasma may contain many dark particles and the morphology of the parasite altered greatly by the limitation of the hyaloplasma. It appears that in this state the infecting organism possesses the power or quality of transmitting some unknown toxin to the nervous centers.

I have been entirely unbiased in making conclusions relative to the etiology of pellagra, as can be observed from the fact that I had written several articles under the title, "Skin Manifestations of Amebiasis," and, in fact, referred to these in my chapter on dysentery in Hirschman's "Hand Book on Diseases of the Rectum, Sigmoid and Colon."

Then it was that a pre-diagnosed pellagrin was brought to me, and at once I recognized the similarity of symptoms present in this case to those in other cases suffering chronic amebic infection.

As early as I have observed amebiasis, at least since the beginning of the Spanish-American War, I have also observed skin lesions, symptoms referable also to the central nervous system, due to toxin poisoning. I therefore very justly concluded that pellagra is not a distinct disease, but a series of symptoms, consequent to parasitic invasion, or toxin poisoning resulting from abrasions of the intestinal mucosa, and entrance of toxins.

I am not ready to assert dogmatically that pellagra has no other etiology or source than that offered by the amebae. I can and do assert, however, as I have done for three years, that there must be an etiologic relationship between the symptoms described and accepted as pellagra, and intestinal parasitism, and that these symptoms prevail in some degree in many cases of amebiasis.

I have at present under observation one patient, who until caecostomy was performed by me as a means of properly treating his chronic amebic infection had and for some weeks following was a frequent sufferer from, the most violent attacks of urticaria I have ever observed. These attacks were really frightful, and yet I observed both stomach and colonic lavage were the most effectual treatment for its relief, and I further observed that since his irrigations have been persisted in he has finally secured relief from those attacks.

In other cases of amebiasis, in which were observed skin symptoms, one of which was strikingly similar to those generally described as pellagra, relief of skin symptoms has been secured, except occasionally a slight burning sensation and encrustation of the soles of the feet.

The fact that relief may follow appendicostomy, or better, caecostomy, in some cases after a period of treatment by irrigations with formalin and iodine solutions, does not follow conclusive proof that the theory is correct with reference to parasitisis, nor that this is offered as the only treatment. On the contrary, I am sure that in many cases, some of which I have observed, the condition has progressed to such extent that it is no longer one of amebiasis nor one of parasitisis, but one of serious results upon the central nervous system, with then a necessity of using cacodylate of sodium or soamine or 606, as would be used, and with about the same degree of success as in locomotor ataxia of syphilitic origin.

The facts are that amebiasis is far more prevalent in this country than even now suspected, that no section of the United States is exempt, it having been observed as sporadic in our own National Yellowstone Park, in the mountain districts of West Virginia, in the farming districts of the Northwest, and in the city of Denver, where I saw a most beautiful case last summer, and in many other hitherto unsuspected sources. I have found veritable nests of the disease in the hilly sections of West Tennessee, and in the best drained and watered city in the South—my own Memphis.

The further truth is, that pellagra is most prevalent in the swampy, lake and fertile vegetating sections, where also amebiasis is most prevalent. Pellagrins always present precedent symptoms referable to the intestinal tract, yet from some I have received positive statements that they had not eaten corn, yet further it is a fact that corn is as bad diet in all cases of amebiasis, as it is said to be in pellagra; nor have some of these cases been bitten by buffalo gnats. Also in not a few cases of amebic infection repeated and thorough examinations have failed to show the amebae until by chance, perhaps, the patient suffered some digestive disturbance, following which many or very few amebae could be found; and among these same cases only a faint suspicion could be sustained owing to the small amount of pathology found in the gut.

I have a suspicion that the amebae may carry with them or in them bacteria or toxins into the blood or lymph channels, or into the tissues, from whence these vessels take them up, or that the effect upon the nerve radicals is conveyed directly from the gut walls. And I trust the pathologists will furnish us with positive proof that the latter is or is not so.

My investigations have necessarily been confined to the clinical study and microscopical examinations, I being a proctologist and not a pathologist.

The South is in duty bound to devote deeper study than mere surface thought to this subject, and much of the work must fall upon the respective boards of health and commissions, the members of which have both the equipment and the ability, as also the inclination, to follow both credible and seemingly incredible paths, no more to prove than to disprove, fancies and fallacies.

Conclusions:

1. Pellagra is not a new disease, nor a disease, in fact, but a series of symptoms complex, presenting the results of parasitic infection in the gut, with consequent abrasions, inroads, as it were, and either absorption of or the conveyance of toxin developing bacteria or the toxins themselves, into the blood or to the central nervous system, the force of which seems mostly spent upon the cervical and dorsal portion of the cord.

2. The amebae seem undoubtedly capable of conveying these toxins or toxin developing bacteria, and probably are their chief intermediate hosts.

3. Some form of amebae has been found in most of the writer's cases, and usually many of these organisms have lost much of the hyaloplasm, are imotile or almost so, and contain many dark particles, a fact and condition not so often found in other conditions as in pellagrins, therefore believed to be significant.

The writer has never observed the degree of prevalence of this morphological alteration in other cases that is found in those of advanced pellagra with skin and nervous symptoms.

If, in fact, a specific bacterial infection is the cause of the symptoms described as pellagra, the fact must yet remain that abrasions of the mucosa or purveyors of the bacteria must also be sought, and no other organism seems more capable than does the ameba in the light of our present knowledge. I am so impressed with the seeming constancy and great numbers of the small, morphologically altered amebae just described, that I really believe they are responsible for the conveyance of the pathogenic bacteria or the toxins which produce the serious results and symptoms erroneously named "Pellagra."

PATHOLOGY OF PELLAGRA.

By H. F. HARRIS, M.D.,
Atlanta, Ga.

From the time of the discovery of pellagra those investigators interested in the subject naturally turned their attention to the pathological anatomy of the disease. Even at that early period intelligent medical men recognized that it was of the utmost importance to determine the changes in the body that occurred in connection with it. Thus we find the elder Strambio, in his great "Dissertations on Pellagra," during the latter half of the century in which the malady was first described, busily engaged in attempting to correlate the symptoms with alterations in the bodies of those dead of the disease. Having first recorded everything obtainable concerning the history of his patients, and later having described the symptoms that they presented, this writer addressed himself to a search for morbid alterations in a manner that would do honor to an enlightened medical man of our own age. Concerning this he quaintly remarks: "I dissected nearly all of the bodies of those who died in the hospital from pellagra, sparing neither fatigue nor diligence, and I described all that which seemed to me worthy of attention, hoping to find in some one of these cases the cause, or the seat of the disease. It was a disagreeable business, but it seemed necessary to bring together the unformed mass of testimony and studies on which we might attempt to build and form our theories with definite knowledge; following in this manner the principle of Baglivio, which wishes first to establish particular cases before proceeding to general principles." It is indeed a pity that subsequent writers should not have followed in his painstaking footsteps—which was unfortunately by no means always the case.

For reasons which we now thoroughly understand, neither Strambio nor those who pursued his methods were able for a long time to discover the real seat of the malady, since this only became possible after the development of modern histologic methods.

The first writer who appears to have devoted particular attention to this subject after Strambio was Labus, who published in 1847 an extended study of the pathologic findings in 200 cases of this disease. Others who studied to a greater or less extent its morbid anatomy were Fanzago, Jos. Frank, Rayer, Carraro, Nardi, Verga, Morelli, Lussana, Frua, Rousel and others, but, although some of these writers noted alterations in the spinal cord, none of them were definitely able to recognize the fact that here and in the brain lay the real morbid changes that produce the symptoms of pellagra. When these writers lived and worked the knowledge of the histology of the central nervous system was but in its infancy, and the time was still far distant when ad-

vances in microscopic technique made it possible to definitely locate the lesions of the malady in question.

While the remarks just made apply equally well to the active period of his life, it is but justice to say that the first who might be called a modern investigator to do methodical work on the pathology of pellagra was Lombroso. In four cases he found the cord softer and whiter than normal, and in one harder. Microscopically there was pigmentation of the ganglion cells, and abundant corpora amylacea in the connective tissues of the brain and cord. The same author mentions a case where the cord was found post-mortem to present a whitish-yellow lesion in the middle dorsal region, becoming more pronounced in the upper lumbar portion of the cord, but gradually fading away as the lumbar enlargement was approached. Below this the tissues were normal. Microscopic examination of the cord in this case was made by Golgi, and it was found that in the region where the lesion existed there was a loss of myalin, and a large number of round and oval, quite granular, nucleated bodies were encountered of a diameter of from 30 to 60 mmm. Many of these cells were surrounded by fine filaments with a granular protoplasm, which now and then divided up into one, two or three prolongations. The cells of the connective tissue in the vicinity of the lesions above referred to were more than normally rich in protoplasm.

Following the work done by Lombroso a considerable period elapsed before another investigator took up the subject of the alterations in the nervous system in pellagra.

The next observations along these lines appear to have been those of Bassi, in 1880, who encountered in the cervical portion of the cord in a case of pellagra a very remarkable proliferation of the ependyma of the central canal of the cord. In the same case the blood vessels in the anterior gray matter showed thickening and sclerosis of their walls. Scattered throughout the gray substance there were numerous corpora amylacea. In seven cases this writer described a degeneration in the gray substance that forms the floor of the fourth ventricle.

Three years later Tonnini made a very great advance in our knowledge of this subject, and this author should be looked upon as really the first investigator to make an accurate study of the nervous system in pellagra. Among the interesting results of this writer's investigations are the following observations: Beneath the arachnoid hemorrhage was found four times in fifty-one cases, all being women; anemia of these membranes eight times, in six women and two men; opacities and thickening sixteen times in thirty-one cases; calcareous infiltration of the arachnoid twenty-seven times in fifty-one cases—these changes have been almost exclusively observed on the posterior and postero-lateral aspects of the cord—in one case alone the lesion being found on the anterior surface. These lesions were found in the lower portion of the dorsal and in the lumbar regions—almost never in the cervical portion of the cord. Asymmetry of the spinal cord was generally found present, and hyperemia and diminution in consistency were generally encountered; softening occurred in twenty cases out of fifty-one. Anemia was also observed, being much more common in women than in men. In thirteen instances the cord was submitted to microscopic examination. Notwithstanding the fact that our technical knowledge was not at that time sufficiently advanced to permit the most exact observations, many of the changes found by Tonnini are now known to be universal in pellagra, and his observations unquestionably constitute a valuable advance in our knowledge of the subject. Under the microscope Tonnini found great pigmentation of the cells of the anterior and posterior cornua in eight cases, disappearance of the nuclei in many of the cells in one instance, and their contours ill-defined in many cases; often the cells were found granular and cloudy as a consequence of the granulo-pigmentary degeneration. Atrophy of the cells was encountered in three cases—once in

the cervical and dorsal columns, and twice in the lumbar regions. In two instances the author encountered degenerations of the lateral columns, and in one case the process was so far advanced that it was apparent to the unaided eye; in the other the change was in its incipiency, and was limited to the cervical region and the upper middle of the dorsal cord. In the first of these cases there were at the same time granulo-pigmentary degeneration of the cells of the gray matter and lessening of consistency, opacity of the arachnoid and calcareous infiltration, and incipient degeneration of the posterior columns. A marked degeneration of the posterior columns was encountered in one case alone, being limited to the lumbar region.

It is thus seen that, according to the observations of Tonnini the lesions of the cord in pellagra are numerous and quite variable. The microscopic examination shows frequently a chronic hyperemia, manifested by opacities, thickenings and calcareous infiltrations of the meninges, and anemia of the cord is indicated (?) by the occurrence of areas of softening. Microscopic examination likewise shows very commonly granulo-pigmentary degeneration of the ganglion cells, particularly of the anterior horns. Scleroses of the tracts in the white substance are common, the lateral columns being more frequently affected than the posterior.

De Hieronimis, in 1885, and Neusser, in 1887, also described alterations occurring in the spinal cord, but the observations described by these writers were of no particular importance.

In 1888 Marchi described changes occurring in the postero-lateral and posterior columns in two cases of typhoid pellagra.

In the same year Tuczek contributed a preliminary paper on the subject of the pathology of pellagra, and reported that he was able to find lesions of the spinal cord in all cases where he had an opportunity of making the proper examination. The complete result of his labors will be mentioned further on.

In the following year Belmondo wrote the first of his most illuminating papers on the subject of the pathology of pellagra. After examining eight cases this writer arrives at the following conclusions: "According to my investigations there occurs in pellagra, therefore, constantly conjoined with its severe forms, systematic lesions, which include the posterior and lateral columns of the cord, thus forming a combined sclerosis. These lesions are accompanied always by alterations in the pia, and likewise changes are found in the gray substance." Again he says: "That the degeneration in the tracts precedes the atrophy of the cells in the anterior cornua is confirmed anatomically by the fact that the latter condition never reaches the highest degree of change, and from the semiological viewpoint, the fact that true atrophy of distinct muscular groups has not been encountered by me." Further on this writer admits that these changes are characteristic of a chronic intoxication, but rather curiously contradicts this view in his later paper, which will be presently referred to, and concludes that the disease is probably caused by some living organism, either in the body itself, or, as is more likely, in the intestinal tract. It should be remembered that the latter paper was published during the golden age of bacteriology, when the whole medical world was enthused with the startling discoveries of German and French investigators, who were finding almost daily, in minute vegetable forms, the etiologic factors in almost every disease known to the medical world, and it is, therefore, but little wonder that a young and enthusiastic observer should conclude that a disease which presents some of the characteristics of an infectious process, is in all likelihood of bacterial origin. The mode of action of micro-organisms was not at that time understood, as we were yet to learn that the effects produced by germs was almost entirely due to toxic substances which they produce, and that at bottom there was no real difference in the poisons elaborated by bacteria and many other toxic substances originating quite independently of them, and that

consequently there could be no differences in the nature of their action.

In the year 1889 and 1890 Belmondo contributed a series of articles on the pathology of pellagra, which are unquestionably among the most important of all the writings that have appeared on this interesting subject. These articles were based on a most painstaking study of twenty cases of pellagra, fifteen of them being of that melancholy type of the disease which is called typhoid. In all of the cases examined by this observer alterations were found in the fibers of the crossed pyramidal tracts, the point of greatest intensity being in the dorsal portion of the cord, extending sometimes into the lumbar and cervical regions. Together with these lesions there were always found also similar alterations in the posterior columns, affecting for the most part the column of Goll, and not infrequently Burdach's tract. Changes in the posterior portion of the cord were similar in every way to those observed in the beginning of tabes, though the alteration was more pronounced in the dorsal region than in the lumbar portion of the cord. He likewise discovered degeneration in the ganglion cells, these being as a rule atrophic, diminished in size, with a few processes, and likewise in young individuals loaded with pigment. This writer does not attach any importance to the closure of the central canal by proliferation of the epithelial cells of the ependyma, since this condition is frequently encountered in other diseases. The pia mater of the cord, particularly of the dorsal region, was found often to be opaque and thickened, and on microscopic examinations the walls of its blood vessels were found thickened; the tissues were often infiltrated with leucocytes. Small hemorrhages into the meninges was also observed.

In seventeen of his twenty cases he noted calcareous infiltration of the pia arachnoid, particularly in the dorsal and lumbar regions.

Tuczek was the next investigator whose work was of importance in pointing out the anatomical changes that occurred in the central nervous system in pellagra. In his monograph he gives in detail the clinical histories and the post-mortem findings in nine cases of typical pellagra, all of which presented very marked changes. In every instance he found alterations in the posterior columns—Goll's column being diseased in all of these cases. In addition the middle rootzone was affected in seven cases, and the posterior median rootzone in three. In six cases the lateral columns were affected. In two instances there was evidence of an inflammatory change in the gray substance—the alterations in one case being very marked indeed. In the same case the author mentions atrophy of the ganglion cells of the gray substance. He also called attention to the occurrence of loss of substance in the gray matter of the cord to such an extent that cysts of considerable size were occasionally encountered. In addition to these alterations pachymeningitis was found in one instance.

As was the case with the spinal cord, the early writers failed to note any alterations of importance in the brain, and here we find again that Lombroso was the first to observe alterations of any importance. In 113 post-mortems Lombroso found in addition to more or less edema of the pia arachnoid, along with thickening, or thinning, or adhesions in some cases, atrophy of the brain in eleven cases, with occasionally hardening of its tissues; in eighteen out of twenty-eight cases the brain weighed less than normal, but, on the other hand, was increased in this particular in seven instances.

By far the most interesting communication that had up to that time been made on the changes in the brain was an article by Babes and Sion in 1899. They showed the presence in the nerve cells, particularly in the large chromophilic cells in the cortex, the presence of unmistakable degenerative changes. The tigroid bodies lose their power of staining with basic dyes, and the cell becomes swollen and vacuolated. The nuclei are frequently pushed to one side and lose their power of

taking basic stains, and present swollen nucleoli; the pigment in these cells is also dislocated, and instead of being around the nucleus, lies scattered throughout the cell-body. The processes of the cells often appear to be broken off and seem swollen. The pericellular lymph-spaces are dilated, and the walls of these cavities are frequently lined by yellow pigment. In the brain tissue small collections of lymphoid cells are frequently encountered, and the neuroglia cells in the vicinity of the blood vessels are swollen.

Up to the present time all recorded post-mortem examinations with thorough studies of the tissues have been made without exception on old pellagrous subjects, and we are therefore constrained to regard as being typical of this affection those alterations discovered in the terminal stages of the malady. I would have no hesitation, however, in predicting that the future will show that the initial changes are in the central nervous system.

However, before describing these alterations, attention will be given to certain changes in the other viscera that are of clinical importance, and still others will be mentioned on account of their theoretical interest.

Skin.—A knowledge of the skin lesions in pellagra dates from Casal's first observations, which began about the year 1735, although his monograph on the subject was not published until 1762. In the meantime Thierry had gained access to Casal's manuscripts, and published, in January, 1755, an account of the writings of the latter on this subject. The alteration begins, as first shown by Reymond in 1889, with considerable suddenness, developing during the course of twenty-four hours after a prodomal period of greater or less length. Merck has recently asserted that there is often a preliminary rash, occurring as discreet maculae, that last from a few days to a few weeks. The erythema begins on the back of the hands, and at the bases of the fingers. It is at first a livid red, and after a few days becomes covered with scales and shed-off epithelium; this hyperkeratosis continues throughout the course of the eruption. and is exceedingly characteristic. The tissues are swollen as a consequence of the increase of both blood and serum in the derma, and as a result the normal elevations and depressions of the skin become more marked than usual, giving to the back of the hand a wrinkled appearance; the contrast between the youthful face and the aged characteristics of the hand are most striking in some subjects. This lesion extends gradually, until in most cases it covers the entire backs of the hands and may reach up to a greater or less height along the forearm and even to the shoulders. It does not often extend to the tips of the fingers, but may do so. After several recurrences the backs of the hands become pigmented and in some cases the skin becomes permanently thinned.

Similar lesions are observed on the backs of the feet, though by no means so common as in the location already described; they always occur with or following the eruption of the hands. In that most excellent monograph of Valdes that writer refers to the frequency of the occurrence of the lesions on the backs of the feet in Yucatan, and it would appear to me from the descriptions I have read of the disease as it occurs that it is more frequent here than in Europe. The erythema may spread to the ankles and legs.

In quite a number of cases the lesion is observed on the face, beginning usually on the bridge of the nose and gradually extending over its entire surface down on the cheeks, and in extreme instances may reach to the chin and lips, and spread itself finally over the entire countenance. It is more frequent in men than women. The scalp remains normal. The eruption may be in small distinct spots, though it is usually confluent. In some cases it occurs also on the neck and extends down the sternum, giving rise to the so-called "Casal's necktie."

More rarely still other parts of the body may be affected, the change being observed on the elbows, on the arm and on the skin, cover-

ing the popliteal space, on the scrotum, around the anus and in the perineal region. In women the vagina may be inflamed and later ulcerated. In a rapidly fatal case in a white man, following the eruption on the hands, I recently observed spots scattered over the various parts of the body of an irregular form, sharply circumscribed, and pigmented to such a degree that they appeared almost black; they were not preceded by an erythema. Similar discolorations occurred in the perineal region, on the scrotum and around the anus. In the severer forms, particularly the backs of the hands, sometimes exhibit small bladder-like elevations filled with serum, which later burst, leaving superficial ulcers that heal very slowly; occasionally similar lesions are found on the backs of the feet and even on other parts of the body. It is said that in rare instances the erythema may cover the entire body. In the mildest forms of the disease no skin lesions occur.

On microscopic examination, as first shown by Babes and Sion, sections of the hyperemic skin exhibit a slight serous exudate, with a few leucocytes, and peculiar homogeneous, metachromatic masses of what appears to be coagulated albumin; the sweat glands contain metachromatic granulations. The small nerves show practically no change.

In the stage of desquamation the changes are much more pronounced. There is hyperkeratosis with shedding off of the corneous layer of the epiderma; the inner epithelium layers contain much yellow pigment. The papillae contain numerous lymphocytes and plasma-cells, with quite a remarkable absence of mast-cells in all cases that I myself have examined. The sweat glands are hypertrophied, and the sebaceous glands are dilated and often contain bacteria. The skin is thickened as a result of the increased blood supply, and from the presence of swollen, degenerated, elastic fibers and the peculiar hyalin albuminous substance already referred to.

Where ulceration occurs there is complete absence of the epithelium layer, with more or less loss of substance on the surface of the derma. The elastic and connective tissues that form the bulk of the latter structure undergo degenerative changes on the surface, and there are found in the diseased structures polymorphonuclear leucocytes, a considerable serous exudate, and numerous bacteria. Somewhat lower down plasma and tymphoid cells are quite numerous.

Tongue.—The tongue undergoes marked changes in pellagra. In the earlier stages the epithelium shows much the same alteration that is observed in the epiderm in the affected areas on the skin. At a later time the epithelial cells shed off around the edges of the tongue, and this may progress until the entire structure appears bare, but a thin epithelium layer may be still demonstrated by means of the microscope. Numerous deep furrows often appear on the back of the tongue as the disease progresses and its tissues become red. Ulceration is then apt to occur, first around the edges of the tongue and in some cases at a later time on any part of its surface. Microscopically these changes are practically similar to those occurring in the skin.

Cheeks and Gums.—Similar alterations are found on the gums and on the buccal mucous membrane, and at certain stages in many cases in the pharynx. As the disease progresses the back of the pharynx assumes a deep red color, sharply circumscribed and symmetrical, this discoloration may be seen advancing forward over the surface of the soft palate in some instances.

Stomach.—The mucosa of the stomach is often found pale, and its walls dilated as a consequence of atrophy of its muscular coat; in some cases its surface is quite red in the pyloric region.

Intestines.—Similar alterations are found in the intestines. Anemia or hyperemia are particularly frequent in the jejunum, and ulcers are apt to occur in this situation, and even more often in the ileum. Similar lesions are occasionally found in the large intestine. Not uncommonly the walls of the gut are thinned. The alteration last mentioned is of

some historic interest, as the Italian Labus claimed in 1846 that it was characteristic, and it was only after this flow had been contradicted by Morelli, and later by a commission appointed by the Congress of Geneva, in 1847, that it was finally established that this lesion is inconstant, and by no means the anatomical criterion of pellagra, as had been claimed.

Mesenteric Glands.—These structures have been occasionally found hypertrophied.

Spleen.—The spleen is usually diminished, occasionally hypertrophied. Metastic foci are sometimes found in this organ.

Pancreas.—Occasionally this organ has been found atrophied.

Liver.—The liver is usually atrophied, though it is sometimes increased in size. In five of my post-mortems the organ weighed only once as much as 1010 grams. Cirrhosis is now and then found. Microscopically the cells of the peripheral portion of lobules are frequently quite fatty, though this alteration is so frequently observed under other circumstances that it scarcely has any significance. The central vein of the lobule has been oftentimes found dilated.

Kidneys.—The kidneys are usually decreased in size, but are frequently found to be normal. Cysts in the cortical portions are frequent as a consequence of the scar formation in these viscera. Microscopically they often show the characteristic changes of interstitial nephritis, with which all are familiar, and which therefore it is unnecesary to detail here. In some instances the only alteration has been found to be fatty changes in the epithelial lining of the tubules.

Adrenals.—The adrenals are normal.

Lungs.—It is rather curious that tuberculosis is rarely found in the lungs of the pellagrous, but hyperemia, oedema and emphysema are occasionally encountered, and pleurisy with effusion is not unknown; all of these changes are evidently in the nature of complications.

Heart.—The heart is often slightly atrophied, and has been found fatty and the fibres pigmented in some cases. This is evidently secondary and of no significance. The pericardium is usually normal.

Oseous System.—The bones are often friable.

Musculature.—The muscles are usually atrophied, but are sometimes normal.

Brain.—The alterations described by Babes and Sion have been in the main confirmed by Marinesco, Rossi, Richette and Grimaldi, and by myself in this country, and are of great interest and importance. In addition to the changes mentioned, I would remark that in all of my cases the small vessels of the brain seemed unusually filled with blood, and the perivascular lymph spaces are quite uniformly dilated. There were no collections of lymphoid cells anywhere in the tissues. The nerve cells showing degenerative changes usually measured less than the normal ones, and always contain a greater or less amount of acidophilic protoplasm. The cells suffer to a varying degree in different parts of the brain. Perhon and Papinian have demonstrated, as might have been expected, that the neuro fibrils of the cells show degenerative changes.

Alterations similar to those found in the cerebrum have been observed by me in the nerve cells of Purkinje. The cell protoplasm loses its affinity for basic stains, and the nucleus undergoes a similar change. The cells contain a finely granular protoplasm that takes acid stains, and in many of the cells only the nucleolus retains its power of absorbing basic dyes. The nucleus does not seem to be dislocated in these cells so often as in the pyramidal cells. In all of my cases it was quite evident that many cells of Purkinje had undergone degeneration and entirely disappeared. In one instance this change was most striking; in this case the molecular and granule layers were in many places separated by microscopic spaces that probably existed during life, and probably have the same significance as the dilated lymph spaces. These cerebeller alterations probably explain the ataxic forms of the malady. So far as I am aware no one has

previously observed these alterations in the cerebellum.

Spinal Cord.—Changes in the nerve cells of the spinal cord are practically in every way identical with those occurring in the brain; they were well described by Babes and Sion in the paper already referred to, and have since been confined by all who have studied the subject. They show every stage of degeneration from slight loss of chromophilic substance to practical destruction of the cell-body. In 1883 and 1884 Tonnini described degenerative changes in the lateral columns of the cord, and somewhat later, in 1890, Belmondo demonstrated the frequented occurrences of corpora amylacae in both the gray and white substance, and the presence of changes leading to obliteration of the central canal. Along with this there was increase in the neuroglia fibers, and atrophy by many of the nerves. In 1893 Tuczek published an excellent monograph on the histology of the central nervous system in this disease. In eight necropsies he found combined scleroses of the posterior and postero-lateral columns of the cord six times, and in two instances a similar change in the lateral columns alone; he confirmed the frequency of the obliteration of the central canal described by Belmondo. He also called attention to the curious fact that portions of the gray substance in the cord are frequently found apparently detached from their normal situations and even lying as isolated bodies in the surrounding white substance; under such circumstances the cord is more or less deformed in appearance. In four out of five post-mortems I have found similar scleroses, and in every instance pronounced changes in the ganglion cells similar to those described by Babes and Sion. I have also in four out of five cases found the central canal obliterated, though in no instance throughout its entire course; the changes are most pronounced in the lower cervical and dorsal regions.

In one instance I have encountered a typical "meningo-myelitis acuta," such as described by Belmondo. Although the post-mortem was made only a few hours after death, the cord was very soft and on microscopic examination was found to present alterations of a most pronounced kind. The myeline sheathes of the nerve fibers showed marked degenerative changes, and the nerve cells of the gray substance exhibited to a high degree the alterations already described. Corpora amylacea were specially abundant throughout both the gray and white substances.

Spinal and Sympathetic Ganglia—The ganglion cells of these structures exhibit changes similar to those found in the central nervous system, though they are not, as a rule, so marked.

Eyes.—From the results of the work of Beitti it is not improbable that circulatory changes are frequent in the central nervous system in pellagra, as he has shown that in quite a proportion of the cases the retina is aenemic, and in about the same percentage the opposite state of hyperemia occurs.

Peripheral Nerves.—It has been claimed by some that the alterations have been found in the peripheral nerves, but this remains without confirmation.

The foregoing is a brief survey of our present knowledge of the morbid anatomy and pathological histology of pellagra, and by no chance could any one properly understand anything concerning this curious disease who has not fully mastered the principal facts stated. The outward manifestations of pellagra are but the external expression of a deep-seated internal malady, which come and go, dependent upon the patient's state of health. When his vitality is lowered from any cause whatever, the symptoms develop; when he rests, lives in the open air, and eats simple, nutritious food, the classical symptoms often disappear. The man who asserts he can cure pellagra with any drug is maintaining that he can do the impossible. The active elements of the central nervous system are in a large measure destroyed, and are replaced by scar tissue, and we might as well attempt to repro-

duce an arm or a leg which was gone as to take away this scar tissue and make new nerve cells. Notwithstanding the fact that the changes in the central nervous system in pellagra have been known for over twenty years, no one so far seems to have taken the lessons that they teach by heart, and we still have a flood of absurd literature on this disease, in which is advocated things in which no real student of the subject could for a moment believe.

PSEUDO-PELLAGRA.

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In spite of the great attention which has been given to pellagra recently in America, and the flood of literature which has followed its recognition in the United States, there is nevertheless some justification for the thought that we are still in a state of disorientation (if I may so express it) with regard to many features of this disease.

The subject of pseudo-pellagra is one of more than academic interest and is by no means the least important of the phases of this complex question upon which our ideas are still far from being definite. Nor can I say we differ greatly in this respect from our European confreres, who, with vastly more experience, still seem here to be on somewhat uncertain ground.

To me it is notable that in American literature the word pseudo-pellagra is rarely, if ever, seen. Yet this word is in common and general use throughout the foreign literature. It must then represent some definite idea of importance. What does it stand for? Where and why did it originate? Is there a need for it? It is the purpose of this paper to try to answer very briefly these and similar questions. Clear definitions are always conducive to straight thinking, and if we can get a definite conception of what is meant by pseudo-pellagra, we may be able at least to comprehend the idea it represents even though we may not be able to throw much further light upon the subject.

The coinage of the word is to be attributed to Roussel (1), who, in his classic works, lays much stress on the rigid discrimination between pellagra and certain other conditions which may superficially resemble it. The confounding of pellagra with these states has led, in his opinion to an erroneous conception of pellagra and consequent mistakes in the diagnosis of this disease. Pellagra he conceives to be two successive, distinct pathologic states. First, the primary toxic malady whose evolution and degree are dependent upon, and determined by the repetition of the toxines producing it; and, second, a cachexia, or a consecutive morbid state, the complex result of the intoxication and of the debilitating conditions produced in time by the primary malady. This secondary cachectic state, being seen most frequently in the hospitals, has, he thinks, come to be regarded as the *type* of the disease, when in reality it is only a state consecutive to the real affection. He further points out that cahexias, or cachetic state, of this character, which are neither definite diseases nor simple morbid states, but are secondary results of a complex nature, all, no matter what their origin, possess a certain common similarity (physiognomy) allied to a sort of general depression. Individuals in such condition have a debilitated nervous system, they

1. Roussel, Th. Traite de la pellagre et des pseudo-
2. Pellagres. Paris, 1866.

*Read before the Southern Medical Association at Hattiesburg, Miss., Nov. 11-14, 1911.

often show a disposition to diarrheas, and slight physical causes (sunlight) easily produce on them morbid impressions (trauma). It is due to these things that there often occur, he thinks, certain conditions which have been confused with pellagra, and many of these cachectic states, from their similarity to cachexias derived from pellagra, have given origin to an erroneous diagnosis of pellagra. This has given rise to the many cases of sporadic pellagra and the so-called pellagra of the insane, and to these conditions he applied the name pseudo-pellagra.

Roussel was an ardent zeist, and with the apparent idea of discrediting zeism, certain of his confreres sought to find a pellagra which could not be traced to a diet of maize. The two most notable of these were Landouzy (2) and Billod (3). The former wrote especially regarding sporadic pellagra, which he claimed to have found among the poor of public charitable institutions and elsewhere; the latter of a special variety of pellagra peculiar to the insane, which he had seen in certain insane asylums.

"The only common point," says Roussel, "between the doctors who have developed these questions has been to sustain the existence of pellagra, or an analogous disease, outside of countries subsisting on maize and beyond the alimentary influence of this grain. For M. Landouzy, of Rheims, and his school sporadic pellagra signifies above all a pellagra without maize. The variety of pellagra peculiar to the insane, described by M. Billod, offers the same conception to those who admit its existence."

So much for the origin of the term pseudo-pellagra, and the idea it represented to the man who, so far as I am aware, first made use of it. His definition of it was not, as is often stated, a "pellagra without maize." This was what it meant to his opponents. Strongly zeist himself, in this matter he seems to have been less concerned with the etiologic import of maize than in combatting what he regarded as serious diagnostic errors. Ultimately, too, he succeeded in showing to the satisfaction of the Academie de Medicine, of Paris, that Landouzy and Billod were presenting as pellagra cases which had only a superficial resemblance to that disease. Roussel also pointed out that if views of this character were allowed to prevail then the logical conclusion would soon follow, as it did, and that pellagra would be denied a place as a distinct morbid entity. It would become merely a symptom complex, occurring in cachectic individuals.

Many writers since Roussel's time—in fact, it is almost universal—have assumed the existence of certain cases which so closely simulate pellagra in general features as to require no little care in discriminating them from the true disease. Indeed, this idea has gradually become of broader significance, and not infrequently it is implied, if not actually stated, that there may exist morbid entities closely allied to pellagra clinically and etiologically (kindred food poisonings) which should yet be carefully discriminated from true pellagra. And so pseudo-pellagra has apparently come to represent either symptom complexes, superficially similar to pellagra, which may arise in cachectic or insane individuals, or allied morbid entities presenting a symptomatology difficult to differentiate from that of pellagra.

From a practical standpoint the clearing of ground upon this subject involves, it seems to me, certain questions the answers to which are by no means easy, if indeed at present possible. Do there exist disease entities or symptom complexes which have no real relation to pellagra, and yet which so closely simulate the phenomena of this disease as to give rise to a constant possibility of diagnostic error? Is our clinical and diagnostic knowledge of pellagra so fully and clearly defined as to permit at least a fairly ready differentiation of this

2. Landouzy, H.: De la pellagre sporadique, Gaz. des Hop. and Union Med., 1860-62-63; and other articles.

3. Billod, E.: Traite de la pellagre, etc., 2nd ed., Paris, 1870; and other articles.

disease? Must we consider the possibility that under the term pellagra there may be included more than one morbid entity?

Before proceeding, just a few words here on the question of a "pellagra without maize." This question eternally obtrudes itself in pellagra literature, and is regarded as one of much importance. As Sturli (4) says, the most rabid zeist is forced to admit that there do occur at least sporadic cases of pellagra without maize. Such cases have ben too often observed and reported by credible and reliable witnesses to permit of further doubt. The real contention—and this is the crux of the matter—is whether there ever occurs an endemic pellagra unassociated with maize. Such pellagra has been reported from Spain, but there is a question as to just whether this disease be pellagra, and the Italian pellagrologists refuse to accept it as such—"Spanish pellagra," they somewhat contemptuously term it. (5)

The almost universal zeist belief in Italy, and elsewhere for that matter, has created much confusion. Medical men in pellagrous sections follow a sort of "vicious circle" in their diagnostic argument. Thoroughly imbued with the maize idea, they demand as an essential premise for their diagnosis of pellagra a history of maize eating by the patient. No matter how typical may be the symptoms presented, they refuse to make the diagnosis of the disease in the absence of such a history.

In the present status of the etiologic question of pellagra, such an attitude, it seems to me, is entirely unjustifiable. If we have once determined the essential diagnostic phenomena, the pathogonomic signs and symptoms of the affection, then, no matter where the diagnosis may lead etiologically, it must be determined upon these signs and symptoms, regardless of any history involving previous consumption of corn. Until more definite knowledge of the causation of pellagra is forthcoming we are not justified in resting so much diagnostic weight on a history of having eaten corn.

To return now to the questions propounded above. Is there a condition which we are justified in recognizing as pseudo-pellagra? There are terms of a similar character in use in medical literature, like pseudo-tubercle and pseudo-diphtheria, but in these cases the discrimination is made on definitely known etiologic grounds and can be controlled by well-tried laboratory procedures. Hence these terms represent very definite ideas about which there can arise little dispute. With pellagra, however, we have neither definite etiologic knowledge nor laboratory diagnostic methods. We are as yet compelled to diagnose and differentiate on clinical grounds alone. Uncertain as we have found such methods sometimes to be, yet this is what we must depend upon until we accumulate wider knowledge; and for the vast majority of diseases such methods are our only dependence. Why, then, create a pseudo-pellagra? We may, with equal right, it would seem, create a pseudo-measles or a pseudo-erysipelas or a pseudo-beriberi.

Personally I have seen many pellagrins, both within and without institutions, and in all stages of the disease; I have found many cases difficult of diagnosis and not a few in which any definite conclusion was at the time seen impossible; I have seen numerous cases offering certain of the phenomena of pellagra and yet not sufficient to permit that diagnosis, borderland cases, pellagroids, if you please, but not pseudo-pellagra, as I understand the term. Such conditions as these present themselves in the diagnosis of many diseases where there is wanting a positive laboratory or other

4. Sturli, A.: Ueber die Etiologie der Pellagra, Verhandl. der Gesellsch. deutsch. Naturforsch. u. Aerzte, 1905, 269.

5. Both Sambon and Alessandrini, among recent writers, have reported from Italy many cases of pellagra without maize. See Sambon's Progress report on the investigation of pellagra, Jnl. Trop. Med. and Hyg., 1910, XIII, 18, 19, 20, 21; and Alessandrini's Sulla pellagra in Italia, Annali d' Ig Sper., n s 1910, XX, Fasc. IV

method of determining the question. Also, in talking with medical men in the United States of extensive institutional experience, I have not found much sympathy with the idea of a condition such as is described and dignified by the term pseudo-pellagra. Perhaps further experience may convince me to the contrary, but at present I think it doubtful whether there is any need for the dignity of such a term.

With regard to our clinical and diagnostic knowledge of pellagra I am ready to admit freely that the disease is a complex and protean one, often admitting of comparatively ready diagnosis, but often, too, frustrating the best diagnostic acumen and the widest clinical experience. In this respect, however, pellagra does not differ from other diseases, nor does its diagnosis offer greater difficulties. Here, as elsewhere, it requires knowledge, experience and judgment to avoid errors. The great desirability of some definite means of diagnosis is too obvious for comment.

Is there a possibility that we include under pellagra more than one morbid entity? This is, to me, a question of significance and importance, not so much from the diagnostic as from the etiologic point of view. Protean as are its manifestations, the disease seems to be a very definite one in onset, evolution and termination; and the phenomena exhibited appear distinctive, characteristic and consistent. This seems to stamp it as a single, definite, morbid entity.

Yet here again, in default of etiologic knowledge and of diagnostic laboratory methods, we may be led astray. Gosio (6) has laid much stress upon this matter, and has pointed out that clinically we may have a dysentery, but etiologically several dysenteries; also clinically we may have a typhoid fever, but etiologically again we may have several typhoid fevers. In both cases we have examples of what appear to be clinically very definite, specific affections, and yet etiologically we have more than one specific cause. May not this analogy be extended to pellagra? That is to say, may we not be dealing with an apparent, definite morbid entity the cause of which need not necessarily be so definite and specific as many imagine it must be?

Closely allied to these matters, if not indeed forming an integral part of them, lie two further questions of some import. These are, first, what is the relation existing between insanity and pellagra, and, second, what is the relation existing between certain alcoholic states and the same disease?

It is, of course, a fact needing no discussing that pellagra may be, and often is, the cause of definite psychoses. The term pellagrous insanity is of common use and has a definite meaning, resting upon a definite condition. But when we turn to the converse of this, that is, whether insanity may be the cause of pellagra, either directly or indirectly, we at once find ourselves upon what is to some debatable ground.

That pellagra is often a secondary disease, engrafted upon some primary depressing condition, is an observation the soundness of which cannot be questioned. From Strambio's time till now all clinicians have been impressed with this repeatedly observed circumstance. And among many other predisposing factors we may, I think, safely include insanity. Why not? Certainly insane individuals are not immune to pellagra, and, given the etiologic factors, they may suffer therefrom as readily as others. Indeed, one might admit, within limits, the possibility that a depressed or disordered mental and nervous system is a rather favorable predisposing condition. But to some the question is of broader import. There are those who think they find in insanity a preponderating predisposition to pellagra; who feel that there is probably between insanity and pellagra a sort of necessary interdependence, a co-relation of the broadest signficance. Theirs is not Billod's idea of a cer-

6. Gosio, B.: Sul problema etiologico della pellagra, Atti III Congr. Pel. Ital. Udine, 1907; and other articles.

tain variety of pellagra peculiar to the insane. It is far more comprehensive. The idea is really too far reaching and too vague definitely to express.

Such opinions do not seem to me tenable. I freely admit that our experience thus far in America may have offered some justification for a thought of this kind. We have apparently found so much pellagra among the insane and to all appearance relatively so little among others that we may be pardoned for wondering at the coincidence. I feel satisfied, however, that fuller experience will demonstrate to us, as it has to the Italians, that insanity and pellagra bear no such broad relation to each other, and that the most important connection between them is in all likelihood the usually accepted one that pellagra is a definite cause of mental disorder in a certain percentage of cases.

As germane to the matter it may be mentioned, or rather suggested, as possible explanation, for at least some of the pellagra occurring in insane asylums, that the disease apparently at times shows a kind of "latency," its striking symptoms omitting for one or more seasons; that mental disorder is not such a very rare condition, and pellagra and mental disorder may occur coincidently in the same individual without any necessary etiologic relation between them; and that the development of pellagra in America very readily lends itself to the idea of a "place infection" such as has at one time been suggested in beriberi, though we are far from knowing what this may mean.

Finally, what is the relation existing between pellagra and certain conditions ascribed to the abuse of alcohol? There has arisen, especially of late in Italy, but also elsewhere, a distinct view that chronic alcoholism may produce in its victims a clinical picture much resembling pellagra, including even a definite erythema which closely stimulates the pellagrous erythema. I have had such cases shown me in Italy, and many writers mention them. The Italians regard these cases as pseudo-pellagra; the French insist that they present all of the symptoms and signs of true pellagra as seen in the polenta-fed Italian. Here again we meet with the viciousness of demanding a history of corn consumption for the diagnosis of the disease. If these so-called ethylic cases can be discriminated on the ground of a distinct difference in signs and symptoms, then such cases may be admitted as not pellagra, but if they exhibit all of the essential phenomena of pellagra, why call them ethylic or pseudo-pellagra? (7) This phase of the subject requires wider observation and study on the part of American students of the disease. It may be also recalled in this connection that Neusser (8) and others have attempted to group at least some of these alcoholic cases under the zeist theory by claiming that alcohol distilled from spoiled corn may contain pellagrogenous toxines.

To conclude briefly, my desire is to emphasize the need of more extensive and more exact clinical observations on pellagra in the United States; to determine more clearly the value of data regarding the existence of symptom complexes or diseases similar to pellagra; to appreciate at its true value what is meant by pseudo-pellagra; and to urge the need of careful studies upon pellagra as seen in our public institutions, especially insane asylums. Such observations and studies would be of particular value in the United States, where the influence of the corn theory of the disease has no such weight as it has especially in Italy, and where consequently individual observations can be made unprejudiced by the veneration of any particular etiologic school.

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7. It may be stated that zeist writers do try to discriminate ethylic pellagra on differences in the skin symptoms as well as in the general symptomatology. For an interesting discussion of the matter, see Merk's Die Hauterscheinungen der Pellagra, Innsbruck, 1909; and also Atti del Quarto Congresso Pel. Ital., Udine, 1910.

8. Neusser, E.: Die Pellara in Oesterreich und Rumanien, Wien., 1887.

A CURSORY STUDY OF THE SKIN MANIFESTATION OF PELLAGRA, WITH REFERENCE TO ITS SPECIAL IMPORTANCE FROM A DIAGNOSTIC STANDPOINT.*

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In presenting this short paper, my main object will be to recite some heretofore unrecorded observations, which have become almost convictions to me. Dr. Isadore Dyer, at the 1909 meeting of this society, presented the subject of the dermatology of pellagra in a paper entitled "Some Differential Points in the Skin Lesions of Pellagra," which was published in the New York Medical Record, November 28, 1909. This article added to the literature of the subject a clear and broad expose of the dermatology of that disease and one could probably do no better than to reread the same paper today. I shall therefore limit the scope of this paper to a brief description of what I take to be pathognomonic skin manifestations of pellagra, and to establish their importance as a plea for an early diagnosis of the disease, an attitude for which I may be criticised by many.

The first evidence of the disease on the skin is the sudden appearance on the dorsum of the hands, back of the forearms and around the wrists, the dorsum of the feet and less often upon the face, particularly around the neck, eyes and upper borders of the ears, of a dull-red discoloration of hyperemic character, disappearing on pressure and accompanied, as a rule, by some burning and itching sensation. The subjective symptoms are most often very slight and sometimes not enough to cause the patient any distress. At times and under certain circumstances many other parts of the body may become involved in the eruptive process. The first stage of the eruption, as you also well know, is constantly being compared to a sunburn, but close observation will show a difference in the color scheme, the latter being, to my mind, more acutely red, if I may use this expression, the former with decidedly more edema of the cutis than one would expect to find in an ordinary sunburn. In the course of a few days the pellagra eruption assumes a deeper hue, a brownish red or mild sepia color, and could readily be mistaken, as has been suggested by some writers, for a mild carbolic acid burn. Coincidently with this change in color, the horny layer of the epidermis begins to shrivel and laminated or furfuraceous exfoliation is fairly begun. The shriveling process, to me, is peculiarly characteristic and particularly so at the border of the patch, where one may find a narrow puckered band of a little darker shade, closely marginated on both healthy and diseased sides. As a rule, after the peeling process has been completed, the skin is left somewhat atrophied, is glazed in appearance and of a brownish red color, with more or less permanent pigmentation over the whole area; or again the pigment may be deposited in small patches, much resembling freckles. If the initial toxic impetus has been unusually severe, vesicles and bullae may form upon the skin, but these are not the rule and occur in comparatively few cases, about 10 per cent, I believe.

In dermatology we lay a great deal of stress upon the color scheme, location and distribution of eruptions of the skin for their diagnosis and differentiation. Some diseases, in fact, are differentiated almost entirely upon such characteristics. The erythema of pellagra, aside from its most persistent appearance upon certain regions of the body, is remarkable for its bilateral symmetry, which is true,

*Read before the Southern Medical Association at Hattiesburg, Miss., Nov. 11-14, 1911.

according to statistics, in 97 per cent of all cases.

The main object of this paper is to establish, if I can, that the erythema I have in mind is unmistakable and absolutely characteristic of pellagra, accompanied or not by the whole symptom complex of corroborative evidence. I purposely make this last statement unequivocal, because I am firmly impressed with the belief that the skin manifestation of pellagra is not necessarily always a terminal sign of the disease, but in many instances a very early symptom, and therefore of very great importance from the standpoint of a timely diagnosis and the application of proper therapeutic measures at a stage when a happy result may be obtained. By a great many writers, if not by most of them, the skin disturbances in the symptom complex of pellagra are considered the most important from the view point of diagnosis, but not a few are still unwilling to make a diagnosis of that disease unless they are present, although the rest of the picture may be more or less complete. Most probably such hesitation in making an early diagnosis will remain until biologic and laboratory researches will have given us a sure and ready way of arriving at an earlier opinion, without the complete series of symptomatic evidence being present.

The many different and increasing varieties of clinical skin pictures in pellagra of which we read, I believe, in some instances, and probably in most instances, purely accidental and incidental features, such as may be due to neglect, traumatism, infection, the general and progressively increasing poor nutrition of the patient, and to trophic changes, which ultimately take place in the whole cutaneous surface, as the disease develops and progresses toward a fatal termination. The severe general ulcerative and destructive lesions being found only in patients in the terminal stages, when there is absolutely no doubt concerning the diagnosis of the disease.

In closing, I wish to say that I am morally convinced that I have seen cases of pellagra where the skin manifestation was practically the only one present of the symptom complex —if any others existed, they were so mild as not to attract attention either of the patient or physician. (Case of young woman at Pellagra Congress, Columbia, S. C. (The case of a woman who came to the Charity Hospital a little over a year ago, accompanied by her four children. She had an undoubted case of pellagra, with skin and other organs involved. Her four children also had pellagra skin lesions, well marked, and quite resembling their mother's, but lacked the other symptoms and appeared to all intents and purposes objectively quite well, with perhaps the exception of a pallor suggesting the existence of uncinaria.) Again, patients who had classical pellagra eruption, in characteristic localizations and otherwise, with another skin disease elsewhere, which also could be diagnosed and differentiated on its own merits. (Case of negro in ward of Charity Hospital, New Orleans, seen by Drs. Fox, Lavinder and myself.)

To summarize:

1. That the skin eruption of pellagra is not always a late or terminal manifestation, but may be a very early one.

2. We should be willing to make a diagnosis of pellagra on the skin lesions, without the symptom complex, because,

3. That if an early diagnosis is made, therapeutic measures may be instituted and thereby save the patient the burden of proving his own diagnosis, which he surely will do if left untreated.

4. That aberrant forms of skin lesions may be and are often due to accidental and incidental causes and not inherent to the initial erythema itself.

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A DISCUSSION OF THE SYMPTOM COMPLEX CALLED PELLAGRA.*

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I wish to make prefatory acknowledgment that I have had comparatively little experience with pellagra. Also that this treatise is mainly a digest of Drs. Lavinder's and Babcock's translation of Dr. Maries La Pellagra. In many places the text has been copied. In conclusion there will be found some personal deductions.

Definition: "Pellagra is an endemic malady which is characterized by an erythema upon the exposed surfaces of the body, by gastro-intestinal disturbances, and by nervous phenomena of toxic origin. It may terminate in severe cachexia or insanity."

History and Geographic Distribution: The history and geographic distribution is so intimately associated with the etiology that no effort will be made to separate the latter into a separate section.

Pellagra made its appearance in Europe about 1720, the epoch of the introduction of corn culture; but according to Babes and Sion it probably occurred long before its scientific description, under the classification of some other chronic diseases. It is difficult, therefore, to determine whether it antedated or followed the introduction of corn culture. The first description recognized is usually accredited to Gasper Casal, of Spain, in 1735.

F. Frapolli is believed to be in error in his interpretation of la pellarella occurring in 1578, having mistaken it for syphilis. However, we are indebted to him for the introduction of the name in 1771, which he found in use among the people.

The history of the progress of the malady and its geographic distribution can be traced in the successive medical descriptions in diverse regions, and shows a coincidence with that of corn consumption.

Greece apparently contradicts this, having already introduced corn culture, but was free from pellagra in 1817, according to Holland; whereas some regions to which this country exported corn suffered from the malady, supposed to be due to defective loading, rains and humidity.

In Arbruzzi, Florence, Arrezo and Senia, where corn has just begun to be used, there is very little pellagra; whereas pellagrins are most numerous in Padua, Brescia, Cremona, Roviga, Ferrora, Novarra, Lucca, Venitia and Bergamo, where corn products are extensively used.

The counterpart of the above data is found in the instances where the cultivation and use of corn having been abandoned pellagra has disappeared.

In Roumania, Felix states that pellagra has made its appearance in consequence of the continued use of spoiled corn.

Antorrin found that after feeding chickens for some weeks on spoiled corn they lost their feathers and drooped; in this condition they laid light eggs and refused to sit on their nests; dogs fed on spoiled corn for six months lost their hair and showed erythema; also, while physician to a penitentiary he found the corn furnished for the soup of the inmates was spoiled. He selected from the prisoners four workmen and three robust peasants and fed them all winter on nothing but corn gruel. In the spring he found that all of them had become pellagrous. The workmen from the city had been in the habit of eating meat and cheese besides the regulation diet. Also, a banker who ate the corn meal gruel every day as well as cheese became a chronic pellagrin. When he changed his diet the pellagra disappeared.

*Read before the Southern Medical Association at Hattiesburg, Miss., Nov. 11-14, 1911.

In Corfu corn has been used for a long time, but pellagra did not make its appearance till within the last twenty years. Corfu has never been able to raise corn enough for home consumption, but imported from Epirus and Albania an equally good quality because harvested in the dry months. Preservation is favored by a dry climate. Some years previous to this observation heavy rains had spoiled the corn crop, and later, as a consequence of an extension of vine-growing, corn was imported from Greece, Macedonia and the countries of the Danube. On account of the long sea voyage, it arrived in bad condition. One community which had no pellagrins so long as it raised its own corn, now having for some years used an imported product, has nine to every six hundred inhabitants.

The readiness with which corn decomposes is explained by the presence of a high fat content and a much exposed embryo.

"Thus corn, if damp, is more subject to mould than any other cereal."

Pellagra is on the increase in Servia, Bulgaria, Roumania, Turkey in Europe, Greece, Ionian Isles, Asia Minor, Tripoli, Tunis and in Egypt.

In Spain, according to Triller, despite the prophylaxis, pellagra affects twenty per cent of the population of certain districts.

Iturbide and others in Mexico have described erythemas combined with nervous and gastro-intestinal disorders analagous to pellagra, but these cases have been questioned.

Ireland consumes a great deal of corn, but it is housed in granaries and preserved by the Devaux system.

Pellagra in France belongs to history, being practically a memory only. Formerly this was different. It must not be forgotten, however, that pellagra disappeared coincidently with the general amelioration of the condition of the peasantry.

"That there is a correlation between the increase in the number of pellagrins and great humidity has been proved for Venetia especially. Parallel statistics have been prepared showing that rainfall and epidemic manifestations coincide."

The quarantina or forty-day crop is the product of the last harvest of corn made in the autumn, which the Italian proprietor leaves to his farmers or to his day laborers. This corn is hung on the outside of the huts and rarely dries as it should; in damp years it quickly decomposes. Further, when the proprietor's corn is unsound it is difficult to sell, and is consequently consumed where grown. Where the farming is done on shares, the proprietors compel the farmers to accept a certain quantity of bad corn.

In places like Biella, Innsbruck and Pavia, although they are corn-consuming communities, pellagra is little known. This is due to prosperity among the peasantry and consequent ability to refuse polenta, or corn mush, and replace it with better food, in the first named place, and the proper drying of corn in the two latter.

In Brianza, though the soil is dry, pellagra is endemic. The corn is damaged on account of storing in silo-like pits made of beaten earth.

"In certain communities the heredity of pellagra is a cause of degeneracy still more destructive than the eating of damaged corn." This is true at Colla, Inverno, Pavia, Dolce Rivola and Sermide, where, indeed, most of the families are affected. Here one can no longer say that the malady is due to the direct influence of corn. The situation is often concealed from shame. "Men were seen to become pellagrous who no longer ate corn, and who often were rich, but suffered from the consequences of an hereditary vulnerability. Besides, in some regions pellagra is synonymous with insanity."

"We always discover in the final analysis the reciprocal relation which exists between poverty and the causes which are recognized as essential for the toxic alterations of corn—

namely, the extension of its planting, defective transportation and the humidity of the mountain climates."

Alsberg, of the Department of Agriculture at Washington, has discussed at some length the entire question relative to the Southern States, as well as conditions and methods in the corn belt. He states that the South raises insufficient corn for home consumption; the varieties of corn planted have been much changed; the rotation of crops has caused a tendency to discontinue the old practice of topping and to resort to that of shocking, which often results in harvesting prematurely, and probably places the grain under favorable conditions for spoiling. Also in this section the whole grain is ground into meal, whereas in other sections the germ is discarded on account of its high oil content and consequent greater tendency to undergo decomposition.

In the corn belt the varieties of corn planted have changed greatly in the last decade, with a contsant tendency to increase the oil content. Most of the oil is in the embryo, and this part of the grain is most subject to spoiling. Hence grain with large embryo moulds readily, and when it does a large amount of toxin is produced. A series of cold, wet falls recently have probably prevented proper ripening. Further, there has been a tendency to extend the culture of corn to dangerous Northern limits. This, together with improper storing and transportation, has caused the throwing upon the market of a product unfit for human use.

From 1879 to 1906 there were received at the asylum at Mobella 2,558 pellagra patients. There was considerable fluctuation in the receipts, as the following figures will show: In 1879 there were received 89; in 1880, 135; in 1881, 97; in 1882, 122; the years 1883-4-5, average, 92; in 1886, 116, and in 1887, 96. We will drop down to 1892 and find 121, then in 1897, 93. The average was fairly high between 1886 and 1900, being 101 3-5; from 1900 to 1906 comparatively low, 81⅞. However, there were 100 in 1903 and 62 in 1905. The difference in receipts in 1879 and 1905 was 27. There is apparently a decrease, but, on account of such wide and rapid fluctuations, these figures may be deceptive.

The surrounding country parallels these statistics for ordinary cases of pellagra.

According to Wallinberg, of the United States Public Health and Marine Hospital Service, reporting to his chief, pellagra contiuues to spread in certain regions of Italy despite extensive interest in its suppression. A vigorous campaign has been waged against its spread, laws enacted concerning it, encouragement offered in improved grain culture, improved sanitation, large sums of money expended, good food and hospital accommodations furnished, and yet the number of pellagrins diminishes slowly. During the last twenty-five years the disease has diminished considerably in the northern part of Italy, while there has been a persistent spread in the central part. The disease invaded Southern Italy in 1908, cases having occurred in the vicinity of Naples and Calabria.

"At present pellagra seems firmly established in the lower as well as in the upper Italian peninsula. The reason for this better showing in the north is not altogether plain, but is partly attributed to the better economic, social and sanitary improvements that have been effected there in recent years. In 1906 there were 6,683 new cases; in 1907, 5,307; and in 1908, 2,763. The mortality seems to be lessening. It changed very little after the law of 1892 came into effect until the years 1906 and 1907, when there was a fall in the total number of deaths to less than one-fifth of those during the preceding years."

The law to prevent the consumption of maize of poor quality has not had the effect anticipated on account of the permission given to mill this quality when not intended as an aliment of man. This leads to evasion of the law.

In Austria, of the population investigated, three per cent were found infected, according to a Vienna correspondent of August, 1909. "The disease seems to follow continuous rains, bad crops and murrain among the flocks."

"For the same reason pellagra has increased in Roumania. In 1901 there were 33,645 cases; in 1905, 54,689; and in 1906, over 100,000."

According to Sandwith, two cases of pellagra have recently been recorded in patients who had never lived out of the British Isles. But the published accounts do not tally with the disease. One of the patients had never eaten maize, but had devoured raw oatmeal and rice.

In Jamaica, according to the American Consul, pellagra is fairly common in the Kingston General Hospital. A corn-free diet was used for twelve months, but Dr. G. L. Manning, the medical superintendent, was not satisfied that the condition was entirely due to damaged corn consumption. There was a diminution in the number of cases, but several new ones occurred long after the withdrawal of corn meal. Also, Dr. J. D. Williams, superintendent of the Asylum of Kingston, speaks of the existence of pellagra twelve years ago, but, on account of the lack of knowledge of its presence in the West Indies, the diagnosis was questioned. Four or five years ago the disease was very prevalent, four per cent of the inmates being attacked.

"With a generous diet, rest in bed and tonics, the majority improved temporarily; others made no improvement, but suffered from chronic diarrhoea, progressive weakness and emaciation until death ended the scene."

A corn-free diet was tried for twelve months, but did not satisfy Dr. Williams that maize is the only cause of this condition. In fact, he records his opinion that Indian corn, damaged or otherwise, is not the sole cause of pellagra.

It is probably present in Barbadoes.

In Yucatan, Mexico, according to Dr. G. F. Gaumer, in 1882 locusts destroyed the corn crops, which caused an importation of this cereal from New York. It was shipped in vessels as ballast, by reason of which it was spoiled. The consumption of this damaged corn led to pellagra among the middle and lower classes. This importation continued till 1891. For the next ten years Yucatan produced enough corn for home use, and cases of pellagra no longer developed. The old cases ran their course fatally. From 1901 to 1907 crops were again failures. Also, from the fact that the hemp culture was found more profitable than that of corn, the people faced an insufficient supply of home-raised corn and pellagra again made its appearance. This time it was not confined to the lower and middle classes. In August, 1909, not less than eight per cent of the population had the disease.

PELLAGRA IN THE UNITED STATES.

In 1864 Dr. P. Gray, of Utica, N. Y., reported a case of pellagra. In the discussion of this case Dr. Tyler, of Somerville, Mass., reported a similar one. Both were insane. Dr. J. W. Kerr, of Corsicana, Tex., claims that pellagra was rife among the Union soldiers at the Andersonville, Ga., prison at about the same time. Dr. H. N. Sloan asserts that this disease was diagnosed in the early seventies in the South Carolina asylum at Columbia, but no written record has been found. Dr. D. S. Pope, of the same State, is satisfied that at least two cases occurred in the South Carolina penitentiary in the middle eighties. Dr. Sherwell, of Brooklyn, N. Y., reported a case of pellagra in an Italian sailor in 1883. In 1889 Dr. Bemis, of New Orleans, left a written diagnosis of a case in a white woman at the Charity Hospital in that city, and in the same year a case occurred in North Carolina, according to E. J. Wood and R. H. Bellamy, of Wilmington. Sandwith, of London, discovered pellagra in Egypt in 1883, and, suspecting its existence in the Southern States, corresponded with medical authorities

and local physicians, but failed to establish his suspicion. Later he found an unrecognized case in a recent Italian immigrant in a Boston hospital, where it was classified with the cerebro-spinal meningitis then epidemic. "In 1902 Dr. Sherwell again reported a case, and Harris, of Atlanta, recorded a case of ankylostomiasis presenting all the symptoms of pellagra." In the next few years the diagnosis was made in South Carolina, North Carolina and Alabama, but no record was made. "Different asylum physicians in the South Atlantic States concur in the opinion that pellagra has existed unrecognized for ten, twenty-five or thirty years." Tentative diagnoses have been made by asylum physicians of other States, but abandoned on account of the supposed rarity of the disease.

An epidemic of pellagra occurred at the Mt. Vernon, Ala., asylum for negroes in 1906, studied by George H. Searcy and E. L. McCafferty, of the hospital staff, with the assistance of E. D. Bondurant, of Mobile, and Isadore Dyer, of New Orleans, and reported by Searcy in 1907. In December, 1907, the diagnosis of pellagra was made by the officers of the State Hospital for the Insane at Columbia, S. C., and carefully reported to the State Board of Health. This report was given wide circulation.

"The American disease was identified with the Italian pellagra in the summer of 1908, independently, by J. J. Watson and J. W. Babcock, of Columbia, S. C."

"In the spring and summer of 1908 pellagra began to be recognized quite generally throughout the South."

Following reports made by Passed Assistant Surgeon C. H. Lavinder from Wilmington, N. C., in the fall of 1908, the importance of the disease was at once recognized by Surgeon-General Walter Wyman, of the United States Public Health and Marine Hospital Service, who said: "These reports indicate that the disease is more prevalent than has been supposed, and that it may in the future assume importance from the public health and economic standpoint, and should receive most careful study."

Special attention was given to pellagra in 1908 by medical organizations in North Carolina, South Carolina, Georgia and other States.

"The South Carolina State Board of Health held a conference on pellagra in October, 1908, and in November, 1909, a national conference on pellagra was held at Columbia under the auspices of the same board. Briefly, these are some of the more important steps in the progress in the present interest in the United States."

"Statistics upon pellagra have been very unsatisfactory. In June, 1909, a study of the subject claimed that the records showed at least 1,000 cases of pellagra in the United States, scattered through sixteen States, and a conservative estimate placed the number at about 1,500 cases in the Southern States since 1906. A year later the conclusion was reached that pellagra exists in thirty-three States, and that the number of cases approximates 3,000, and that a total of 5,000 cases had occurred in the last five years."

Interesting foci of pellagra have been observed at the insane asylums of Georgia, North Carolina, Florida, Louisiana and Virginia.

"In the summer of 1909 the disease was recognized as existing at Cook County (Dunning) and Bartonville (Peoria) hospitals in Illinois."

In June, 1910, Passed Assistant Surgeon J. D. Long, U. S. P. H. and M. H. S., verified the diagnosis in nine cases in the Philadelphia Hospital for the Insane (Blockley)."

"Several cases have been recognized in the public institutions of California."

"Special commissions for the study of pellagra have been appointed by the United States Public Health and Marine Hospital Service and by the Governor of Illinois and

the State Board of Health of North Carolina."

PELLAGRA IN CUBA, PORTO RICO AND PANAMA.

"Very rarely cases of pellagra have been imported into Cuba from the Austrias, and occasionally a tentative diagnosis has been made in natives or residents usually alcoholic or sufferers from sprue (Jan Guiteras)."

"B. K. Ashford has reported one case in Porto Rico and J. A. Hayne two cases from the Canal Zone."

SPOILED CORN.

I deem it needless to describe the physical nature of spoiled corn. However, the main differences, chemically and physiologically, between spoiled corn and the sound grain, are these: "Spoiled corn yields a red substance slightly poisonous, which, when dissolved in caustic potash and sulphuric acid, produces red-brown flakes insoluble in ether, and precipitates in potassium iodide reddish flakes, but with absolute alcohol flakes of a pale yellow color."

"Sound corn yields a yellow substance which does not precipitate either with absolute Alchol or iodide of potassium; this product becomes liquid in sulphuric acid and ether, and is absolutely harmless."

The name pellagrosine or toxic substance is given to the poison of spoiled corn. Several different moulds have been experimented with, and each has produced in animals nervous phenomena interpreted as the pellagra of man. After examining several experiments the conclusion is that we are dealing with an intoxication produced by poisons developed in spoiled corn through the action of a number of micro-organisms in themselves harmless to man.

From corn spoiled in the 1883 hail and inundation in the districts of Mazze and Vischi, botanical examinations showing aspergillus and rhizopus, and to a certain extent bacterium maidis, ten dogs and a large number of chickens were fed during a period of from six to eight weeks up to the end of life. In the dogs, to prevent the objection of inanition, flour bread and scraps of meat and bone were added to the diet. The following abnormalities were observed:

Weight—All the adult dogs lost in weight, beginning at the end of three, four, five, six, seven and twelve days. *Temperature* was elevated in all. *Pulse* and *Respiration* did not show digression except in two cases in the presence of tetanic convulsions. *Muscular Spasms* were frequent, but not constant. *Diarrhoea* was the most frequent of the complications. *Erythema* of the skin was manifested only once, completely and certainly, and then in a dog that remained free from anaemia, torpor and spasmodic phenomena, and in which the sitophobia and paresis disappeared with the appearance of the eruption. The microscopic examination did not exclude the parasitic origin of the erythema. *Anaemia* was not constant.

The conclusion drawn is: That in dogs pellagra shows itself sometimes under the anaemic form, sometimes under the spasmodic form, and sometimes under the cerebral form, which is precisely analogous to the pathologic anatomy and symptomatology in man, in whom it is erroneous to speak of pellagra in general, and is more didactic than scientific to make divisions into first and second stages. A more accurate division would be made into anaemic, spastic, tabetic, cerebral and other similar forms of pellagra.

In twelve chickens fed on spoiled maize convulsive phenomena were exceptionally noted, and, if complete marasmus could be excluded, the spoiled corn alone produced increase of weight; but finally death intervened after atrophy of the feather follicles, with changes in the skin and the horny appendages.

A fact worthy of remark is that chickens entirely tame for months became very wild at the end of five or six months on the regimen of corn; they fought their companions and had to be shut up. Another chicken had photophobia and was unwilling to leave the

cage. "Taken altogether, the disease was less pronounced in the chickens than in the dogs."

Tincture of corn spoiled by penicillium glaucum was given for a time to twelve sound and healthy individuals, and at least two-thirds of their number showed varied and indefinite nervous symptoms.

Pellagrosine and the oil extracted from spoiled corn produce in animals convulsive phenomena, followed later by paralysis. An aqueous extract produces more of a paralysis. The convulsive phenomena are not so evident.

Practically all of the animals and men experimented upon by the various observers, and with different extracts and whole meal, lost in weight.

The conclusion, according to Lombroso's teaching, is that pellagra is due to the constant ingestion of an exogenous toxin resulting from the growth upon corn and corn products of several kinds of putrefactive bacteria.

There have always been objections by a few observers to the idea that pellagra is due to the ingestion of corn products alone. For example, Gosio, in his etiologic review, said:

"Indubitably, the various toxic moulds of corn have the power of producing a form of poisoning which has many points of contact with pellagra; but if this be, in reality, pellagra, or such pellagra as is observed in practice, if the syndrone which happens to be produced in animals by poisons of moulds represents without doubt the specific pellagra of man, it yet remains to be rigidly demonstrated." "Always, however, one speaks of a proof which does not make a break in the true nucleus of the problem, which is the demonstration of the chemical identity between poisons circulating in the blood of pellagrins and the poisons of moulds."

Tizzoni considers pellagra due to a streptobacillary infection, but the correctness of his observations has not been confirmed by other observers. He claims to have produced pellagra with this organism, and believes it to come from spoiled corn.

A general review of the observations and experiments shows that each observer, working with different micro-organisms, has produced a symptom complex interpreted as pellagra. It is very evident that there can be but one fundamental cause of the disease. However, there may be many contributory causes—in fact, there seem to be.

Dr. Sambon enters some strong objections to maize as a cause of pellagra. They are:

1. It is found in places where maize is neither cultivated nor eaten.

2. It is absent from many places where maize is the staple food of the population.

3. It has in many places either decreased or become more prevalent without any change in the food of the people.

4. Its constant and peculiar distribution does not agree with the very irregular and ever-changing distribution of spoiled corn.

5. In over a century and a half, since the maize theory was first suggested, no one has been able to prove it.

He believes it to be a parasitic disease, because:

1. For years the person affected may present some seasonal recurrences which can only be explained by a parasitic agent, with alternating periods of latency.

2. It shows a constant and characteristic topographic distribution.

3. It shows a definite seasonal incidence.

4. Its symptoms, course, duration, morbid anatomy, as well as its therapy, are similar to those of the other parasitic diseases.

5. Of two places almost contiguous, one may be affected, the other not.

Pellagra is insect-borne because:

1. It is limited, like malaria, sleeping sickness, etc., to rural districts, and more especially to the vicinity of certain bodies of water.

2. It has a definite seasonal incidence—spring and autumn.

3. It affects to a large extent a certain class of field laborers.

4. It is not contagious, and neither food nor water can account for its peculiar epidemiology.

5. Within its epidemic centers it affects all ages and frequently whole families.

6. Outside its epidemic centers it affects only adults who have visited the infectious areas, and frequently only one or two members in a family are affected.

Sambon incriminates the sand fly, or Simulium-Reptens, as the disseminator of the disease. Dr. Sambon's reasons for not thinking corn and corn products the sole cause of pellagra seem to offset the apparently strong reasons for believing in the maize theory. The geographic reasons are met by the distribution of the insect carrier, the seasonal and humidity factors likewise, as well as the irregular distribution of the malady. He further finds pellagra where corn is not used as a food; also in certain districts where corn is not the staple no pellagra is found. He does not attempt to meet the experimental question, although these experiments, carefully carried out, educational and salutary in value, cannot be depended upon for sound, positive conclusions as to the identity of maize poisoning in animals and the pellagra of man.

Indeed, most of the animals and human beings subjected to these experiments showed toxic symptoms, where as comparatively very few consumers of spoiled corn are affected with pellagra. Besides, the clinical identity will not bear the closest scrutiny, where symptoms do, no parallel division of the clinical picture is made to show agreement. Every phenomenon, both experimental and clinical, is made subservient to one idea—maize. The seasonal recurrence or recrudescence do not agree to what we should expect, from the Zeists' standpoint. The greatest number of infections are found in the spring. They claim that most of the bad corn is eaten where it is grown. This is true, at least, for certain districts in Italy. Granting this, we should have the greatest number of infections in the fall. However, in certain districts, where corn is purchased abroad and the deliveries made in the spring, or the old supply having been consumed by the end of the winter, we should expect the greatest number of infections at this season of the year—spring.

In this country our knowledge is too limited to be positive whether or not there is a constant and characteristic topographic distribution.

Here it appears to attack the female oftener than the male. This does not show well for Sambon's theory that it is insect-borne.

Further, I do not believe that, even where it is epidemic, the disease often attacks more than one member of a family. From what information I can gather, this appears to be true, for this section of the country at least. The Zeists do not dwell upon this point. Outside the endemic centers Sambon claims that only adults who have visited the infected areas present the disease, and frequently only one or two members of a family are affected. This again is contrary to what seems to be true here. The females of this country stay at home more closely, and yet are more frequently infected.

The Italians accused the Spanish of bringing syphilis from America. They also claim that pellagra made its appearance soon after the culture of Indian corn was begun. Soon after the discoverey of America the use of tobacco was introduced. We can then justly infer that syphilis and pellagra made their appearance in Italy about the same time, or, rather, that they were recognized at about the same period. It is said they were frequently confused the one for the other.

Pathologically, pellagra resembles syphilis, or, I will say, parasyphilis, more than any other disease. There are a great many of the clinical features that resemble syphilis—namely:

1. Symmetrical eruptive lesions.
2. Seasonal recurrence or recrudescences.
3. Rectal ulceration.
4. Paretic and other like nervous phenomena.
5. A fairly high percentage of abortions.
6. Heredity stigmata.
7. Liability to recrudescences after surgical operations and other shock.
8. It is found most frequently where syphilis is most prevalent—namely in insane hospitals, penitentiaries and orphanages.
9. According to most observers in this county, it is most prevalent among the negroes, and it is conceded that syphilis is much more frequent among them than among the whites. Also, viewed from the standpoint of bow-legs, the Italian is quite as often affected with syphilis as the negro.

How do we expect to explain, if syphilis is a factor, the prevalence of pellagra where syphilis is less prevalent? It is admitted by all that pellagra is a disease of the poor and the neglected. Because a man is poor is no reason why he should not contract syphilis. But, having contracted the disease, he has not the means to procure medical services to perfect a cure. Consequently we have a greater number of uncured cases of syphilis in this class of patients than in any other. Women have pellagra oftener than men; they are oftener neglected in all venereal diseases. In the cities we have, of course, a greater number of people infected with syphilis; but there are present the free dispensaries, so that the poor have the opportunity to obtain medical service if they desire it. It is otherwise with the poor of the rural districts.

Further, in the city dweller, whose ancestry has lived for generations in centers of population, there may have developed some immunity that renders him less susceptible, at least to lesions of the central nervous system.

Syphilis is certainly contagious; pellagra admittedly not contagious. How, then, shall we explain their identity? The diagnosis of pellagra is based almost entirely on the skin lesions. These later, by most observers, are considered trophoneurotic, and, therefore, not lesions of the disease, but the result of lesions of the central nervous system. In other words, pellagra appears to be the expression of late or parasyphilis of the brain and spinal cord, or a very similar disease.

In this connection I will say that, upon inquiry, Dr. R. R. Ivey, of the Mt. Vernon, Ala., hospital staff, under date of October 11, 1911, writes: We have in the hospital now thirteen cases of pellagra, mostly of the chronic type—seven women and six men. Among the women there are two showing a few signs of remote syphilis; among the men there are three showing such signs and one of active syphilis." Dr. Ivey admits the difficulty of making a diagnosis among the insane.

The reason for the development of an erythema in the country more than in the city is on account of the more frequent exposure of the people to the sun; also on account of poor nutrition due to an unchanging diet. Here is where, if we associate maize or any other monotonous diet with syphilis or some other chronic disease or affection, we find the explanation why pellagra attacks one or more members of a family and leaves the others untouched.

Also tobacco, being a nerve poison, may be considered a contributory factor. It has been my observation that pari passu with the development of misery, there is an increase in consumption of tobacco, and that in the worst form—chewing and snuff-dipping. It is evident that there is a fundamental cause, aside from any dietetic factor, that causes symptoms to develop in only a few out of many persons living under identically the same conditions.

You may ask the question: Is it a fact that rarely more than one member of a family is a victim of the disease? I will answer that I believe it to be true. I wrote to twenty-five prominent physicians and received twenty-

three replies, and only nine times were there more than one member of a family affected out of a total of 126 cases.

This agrees with my personal observation. The above is only a "straw ballot," so to speak, and one should not draw positive conclusions from it. But certain facts, though drawn from a small number of observations, are so convincing that one cannot help forming an opinion. The opinion is: *That if maize, spoiled or not, is the sole or even the paramount factor, we would have a greater proportion of infections to the number of exposures.* It is to be regretted that the Italian statistics are not very clear on this point.

I wish here to thank all of my friends who so kindly assisted me in the collection of the data referred to above.

TREATMENT OF PELLAGRA.*

By JOHN A. KIMBROUGH, M.D.,
Thomasville, Ala.

The rational treatment of any disease depends largely on knowledge of its etiology, and as the etiology of pellagra is not yet well understood, it follows that the treatment is not satisfactory. I do not mean that there is not anything we can do to benefit and, in fact, perhaps cure a good per cent of the incipient cases, but that we have no specific, as quinine in malaria and mercury and iodide of potash in syphilis.

Holland, in 1817, wrote: "In short, it appears that mere medicine has done very little for the relief of pellagra." This gloomy outlook has been shared by others.

We think an early diagnosis is of the greatest importance in the successful treatment of the disease.

When recognized early and appropriate measures are instituted, improvement is often satisfactory. But to make an early, positive diagnosis is often very difficult, and, in fact, impossible, because of the fact that the characteristic skin symptoms are almost always late in making their appearance.

We think cases presenting the symptom-complex of pellagra, though indistinct, should be considered pellagra and be treated accordingly.

Patients with incipient pellagra should be kept out of the sunlight and, if the symptoms are acute, should be put to bed in a dark and well ventilated room. A good liberal diet should be allowed.

Plenty of meats and vegetables should be given, and, in fact, a fair variety of nutritious foods is necessary. We think no corn products should be allowed.

Great cleanliness should be observed throughout the course of the disease; daily tepid baths should be given, and two or three times per week salt baths or salt rubs seem to be of benefit.

In the incipient, mild cases, these measures alone often cause the symptoms to clear up.

In the severer types the symptoms increase in spite of these and other measures, and we are confronted with a most troublesome condition.

When there is great prostration and loss of appetite the patient should be sustained with predigested foods, buttermilk and other easily assimilated nourishment.

Stimulants, such as wine, brandy and whiskey, well diluted, are occasionally of much benefit.

Nutrient enemas are sometimes neecssary when the stomach will not tolerate the lightest foods.

*Read before the Southern Medical Association at Hattiesburg, Miss., Nov. 11-14, 1911.

Daily saline enemas, given by Murphy's drop method, are valuable in helping to sustain these patients.

One-half to one pint of saline solution given under the skin frequently has marked beneficial effect.

The Italians think that chloride of sodium has somewhat of a selective effect on the disease.

Of all the drugs that have been used in the treatment of pellagra, arsenic stands at the head of the list. It may be prescribed in the form of Fowler's solution or any of the other preparations. It is claimed by some that it is contraindicated in the acute stage of the disease. Cacodylate of soda in three-grain doses given every three days has been warmly recommended by Dr. Elrod, of Forsyth, Ga. I have used it in three mild cases and one severe one. The mild cases recovered in course of a few weeks, the severe case continued to grow worse and died about one month after the treatment was begun.

Atoxyl is another form of arsenic that has been extensively used, and seems to be of benefit in a large number of cases. Salvarsan has been used, but it has proved to be of no benefit.

Formin is another drug that has been warmly lauded. It is given in seven to ten grain doses three times daily, well diluted.

Sulphide of calcium has been used with apparent benefit in a number of cases. It must be a fresh, pure article, from a reliable manufacturer. It deteriorates with age. From one-half to one grain every twelve to six hours is given in tablet form.

Iron in the anaemic and general tonics when indicated should be employed.

Locally very little treatment is necessary; the stronger antiseptics and ointments do no good, but are harmful. When we have a mixed infection it is best then to employ some weak antiseptic lotion or ointment.

The special symptoms will have to be met and treated very much as the same symptoms in other diseases. The diarrhoea, which is often persistent, usually yields to large doses of subnit. bismuth and salol. Sometimes morphine has to be resorted to in addition to the above.

For the restlessness and insomnia the bromides are of service, but in the worst cases we have to resort to the more powerful sedatives and narcotics, such as morphine, paraldehyde, trional and sulphonal. Hydrobromate of hyoscine is also of service.

Cole, of Mobile, has used blood transfusion in twenty odd cases with good results. He warmly advocates this in the more desperate cases, and his statistics make a good showing in the class of cases in which it has been used.

At the present time a change to a high, cool climate seems to promise the best results, such a climate as Asheville or Waynesville, N. C., and Tate Springs, Tenn. Dr. Bass, of New Orleans, has had about a dozen cases go to Tate Springs for a few months in the summer, and nearly or quite all were benefited by their stay there. I have had two cases relieved of the symptoms by a stay of a few months in Asheville, N. C. The cases sent to the mountains are too few to draw conclusions from, but the results thus far obtained are very encouraging. For those who are able, it seems that a good plan would be to go to the mountains early in the spring and remain until cold weather before returning home. That the cold weather has an effect on the disease we have ample proof in the fact that most of the incipient cases clear up in the winter. Little can be suggested in the way of prophylaxis. The concensus of opinion is opposed to any theory that the disease can be acquired by contact, however intimate. Lavinder quotes Neusser as stating that in the great pellagra hospital at Mogliano Veneto, in Italy, where for many years hundreds of cases have been cared for by sixty or seventy attendants, "no attendant or nurse has ever been known to develop the disease," and it is well known that a second case of pellagra seldom appears

in the same family. Hence, prophylactic measures against contagion are unnecessary. There are, however, instances where from two to six members of a family suffered. It is not absolutely proven that maize products can cause the disease, but they certainly aggravate an established case, so that in case of apprehension they should be avoided. The only measure certain of success is residence at a high, cool altitude.

TREATMENT OF PELLAGRA.*

By LOUIS LEROY, B.S., M.D.,
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Until such time as we have gained a more definite knowledge of the etiology and pathology, it is impossible to offer a really rational system of treatment, and all our efforts to alleviate or cure this malady must be based upon empiric or symptomatic grounds.

If we are to consider the disease as infectious it is logical to attempt by means of our present metallic germicides in large doses to obtain some measure of specific action. If, upon the other hand, we are to regard the cause as a toxine coming from without, our efforts should be in the direction of preventing ingress of such toxines and the elimination of those already present, followed by such measures as would favor a regeneration of the tissues destroyed. If we are to consider the origin of the disease as a toxic substance developed within the body or its cavities our object should be to prevent the entrance into the body of any substances whose decomposition might yield the toxic agent or which might produce injurious materials from substances or tissues more or less normally present in the body. It has been more or less customary to divide the treatment of pellagra into several groupings, such as climatic, hygienic, medicinal and surgical, which division serves well enough for cataloguing the measures at our command, but offers little as a basis of principles of treatment, and it is to be hoped that more attention will be given in the future to elaborate a system of treatment upon this basis. While not strictly a matter of treatment, it may be well to consider something of the means at our disposal for the prophylaxis of this disease.

While being perfectly familiar with the evidence at hand in the etiology of pellagra, the writer does not hesitate to say that, at present at least, he is quite firmly convinced that pellagra is dependent for its existence upon the activity of some living organism which is or has been developing within the body or its cavities. Just how long this parasite may have been acting before definite symptoms make their appearance, and whether or not they are still present and active in the latter stages of the disease, is a matter of conjecture, but it appears that they may antedate by years the appearance of any symptoms of importance, and it would not be surprising if, in the latter stages of the disease, marked as it is by the evidences of extensive degeneration, that any parasites which were primarily active had either disappeared or become comparatively insignificant factors, as, for example, might be the case in the later scleroses and degeneration in syphilis. It is our observation in a large number of cases in Tennessee that the advent of an outbreak of pellagra in a neighborhood has followed the presence of a previous case, often when that case developed elsewhere and came to the locality suffering with the disease. In other instances cases have developed at some distance from each other

*Read before the Southern Medical Association at Hattiesburg, Miss., Nov. 11-14, 1911.

when there has been the opportunity of transmitting any infectious material which might be present, as, for example, in the case of a woman who had done the washing for a pellagrin. Again, acting upon this supposition, we were enabled by isolating all cases out of seventeen which developed in one of our State institutions, to completely stop the development of new cases, or at least where, in three years, starting with one case, eighteen cases did develop, no more cases followed after proper isolation precautions had been instituted. In view of the well-known role which many insects play in the dissemination of other diseases, and in deference to the views and investigations of Sambon, all pellagra patients should be kept in adequately screened apartments and care should be taken to exterminate all vermin which might infest the clothes, beds or premises. All discharges from the patients should be sterilized in some adequate fashion, preferably, I believe, with formaldehyde, before being disposed of. Whether or not a low state of vitality acts merely as a predisposing cause to an infection or may be, as is maintained by those who oppose the idea of its infectious nature, acts as a direct cause, it is certain that those of otherwise poor constitution are more liable to develop pellagra. Therefore, in localities in which the disease is prevalent, efforts should be made to improve as much as possible the general hygienic condition, and to have supplied as much as possible a wholesome and varied diet. Upon general principles efforts to prevent the use of spoiled corn as a diet should be commended, but the statistics of those who have devoted nearly their entire energy to this one phase of the subject appear far from convincing one that this alone has more than a contributory value.

In those communities in which various intestinal parasites abound, such as uncinariasis and amoeba, I believe that it may be taken for granted that systematic work tending to eliminate these diseases will be followed by a diminished number of cases of pellagra.

In mild cases of pellagra or in those cases in which a cure seems to have been effected, a great deal of care should be taken to observe the usual rules of hygiene. The patient should have a moderate amount of exercise and fresh air, avoiding, however, fatigue and the direct rays of the sun. The diet should be varied and contain a reasonable amount of fruits and green vegetables, and without question corn or any of its products should, so far as possible, be excluded from his diet. This does not in any way argue for or against the parasitic origin of the disease, for we are all thoroughly familiar with the effects which alcohol, for example, has in aggravating syphilis, or quinine in aggravating gonorrhoea, neither of which substances having any causative relation to the respective diseases.

Whether or not the action is a specific one, there seems to be no question but what the majority of cases will at some time or other be benefited by arsenic, and I believe that it may be accepted as a general proposition that the earlier it is given the greater the benefit that may be expected from its administration. Early in the disease its action when given in large doses appears to be almost specific, whereas late in the disease, when extensive nerve degenerations have taken place, I believe that the large doses tend rather to do harm than good, and that if benefit is to be derived from arsenic it will be only when the drug is given in small doses, in which case it owes its action to the effect upon the blood, increasing hematopoietic activity and possibly having some stimulating effect upon the regeneration of nerve tissues. In the earlier stages I have found more uniform benefit from the administration of soamin hypodermically starting with one grain doses every other day and increasing up to three or more grains to the dose until from seventy-five to a hundred grains have been given, when a

period of rest for a couple of weeks is given, followed by another course of the drug if necessary. I have used atoxyl in the same manner, but have not had a chance to compare the two critically. I have also used sodium cacodylate, but it is my impression that soamin is somewhat preferable. I have not had a chance to try arsacetin, but the reports from this agent are not very satisfactory. My observation of salvarsan in pellagra is such as to discourage its use, but must admit that I have not had the chance to administer it according to the method recently recommended to me by Martin, who reports some good results in giving fractional doses of the drug repeated at intervals of a day or so intravenously. For internal administration, I believe that I have had a little more satisfactory results from Donovan's solution than from Fowler's solution, although both have at times been very satisfactory. Some patients possess a very great tolerance for these remedies and others show symptoms of arsenic medication with as small doses as three or four drops. Whichever the condition, early in the disease I push the drug to full toleration, and later, where there is evidence of extensive degenerations and marked anemia, I only give it in what might be termed tonic doses.

The method recommended by Babes, of using atoxyl hypodermically, arsenious acid internally in one-thirtieth grain doses and about a drachm of a 2 per cent arsenious acid ointment rubbed into the skin, would seem valuable in the early stages of the disease where very extensive arsenic action is desired, but upon purely theoretical grounds it would seem that too frequent use of ointment might be followed by injury to the skin, although Babes only recommends its use on two successive days, with a week's interval before further use of the ointment. His extensive experience and sound judgment, however, should commend the procedure to further trial.

Iron preparations have not seemed to be of any value unless possibly after apparent cure, when the patient has maintained a considerable diminution in hemoglobin.

Iodine and its preparations have been rather disappointing and have only seemed to do good for a short time, when their effects have probably been due to the elimination of products of necrosis or degeneration and ceased as soon as this small amount of elimination had been accomplished.

Mercury has only seemed to do harm excepting as before mentioned when combined with arsenic in Dŏnovan's solution.

Massage and hydrotherapy are both extremely useful, salt and bran baths being specially beneficial. The salt baths are best given daily at body temperature, using a coarsely powdered salt, a handful at a time, just moistened and then rubbed quite vigorously all over the body, taking care not to handle any areas of eruption too roughly.

Massage and baths are always more satisfactorily administered in hospitals, and for that matter all pellagrus patients seem to do better when taken to a sanitarium of some kind. The treatment of the skin lesions depends largely upon their nature, but the tendency to error is towards too much rather than too little treatment. It must be borne in mind that most of the time we are dealing with a congestion which is due to great relaxation of the blood vessels, and under nutrition of the skin together with a marked tendency to degeneration, and not to a true dermatis of inflammatory nature. Where the redness is beginning, and the surface of the skin is only slightly, if at all, broken or denuded, a plain, moist dressing of boric acid solution or an ointment of boric acid or oxide of zinc is all that is usually required. An ointment may be made of zinc oxide and subnitrate of bismuth liberally applied, which, in addition to being soothing in effect, is practically impervious to the actinic rays of diffused sunlight. This ointment will be found especially beneficial in lesions of the face or neck, as the hands may be well protected by a light pair of gloves.

Where convalescence has been established, and the epithelium is being regenerated, but is still tender, and tends to "weep," the surface may be painted occasionally with a weak solution of picric acid. Where extensive sloughing has occurred and a mixed infection of pyogenic bacteria have become associated, the parts should be washed daily with dilute solution of peroxide of hydrogen and some antiseptic dusting powder, such as aristol or bismuth formic-iodide, lightly dusted upon the surface.

If the general health of the patient has not been too seriously impaired, the use of an autogenous vaccine may limit the extension of the septic process and development of constitutional injury. Calcium sulphide internally should also be given. When the skin lesions have not been too severe and we have only to deal with the bran-like desquammation and parchment-like dryness and thickening of the skin, the salt rub before mentioned, together with daily massage with lanolin or cocoa butter, will generally meet the indication. In all of these conditions the skin should be protected from sunlight, and if the patient be around a hospital, he should not be permitted to come within the influence of X-rays or the light from an arc lamp or mercury arc.

The gastro-intestinal symptoms are frequently quite troublesome and the most frequent single cause of this trouble is apt to be the absence or paucity of hydrochloric acid in the gastric juice. So frequent is this condition that it is almost a safe routine to add hydrochloric acid to the treatment of this disease. I have found satisfactory results from the use of twenty drops of dilute hydrochloric acid, or nitro-hydrochloric acid, with a drachm of essence of pepsin with perhaps ten drops of tincture of nux vomica after each meal for an indefinite period. Johnson has recommended a prescription of potassium chlorate, tincture-chloride of iron and essence of pepsin for the same purpose. Where vomiting is troublesome, a mixture of cerium oxalate, chloretone and sub-nitrate of bismuth will often prove beneficial.

The sore or ulcerated mouth often gives the patient more discomfort than any other symptom and may be extremely refractory to treatment. I have not had much success in the use of the stronger astringent preparations, but believe that in most cases, dilute peroxide of hydrogen, the alkaline antiseptic wash of the National Formulary, chlorate of potash and dilute tincture of myrrh will be found among the most useful remedies. Between times and at night the mouth may be rinsed with milk of magnesia to neutralize any acid formation from decomposing particles of food. The diarrhoea of pellagra is frequently very resistant to treatment as well as weakening to the patient. Furthermore it is not always safe to check this too suddenly, for it is a clinical fact that a sudden stopping of the diarrhoea may be followed by an increase in the severity of the symptoms of the disease or the advent of new symptoms, whether the diarrhoea be interpreted as an attempt at elimination of toxines or not. As a rule, large doses, a drachm or more of sub-nitrate of bismuth, together with salol and albumin tannate, limit the more excessive discharges. I have not been satisfied with the action of the vegetable astringents and believe that in the majority of cases lead and opium are apt to do more harm than good. Enemas of cold water or boric acid are of use where there is much tenesmus, but I believe that silver-nitrate, quinine and the copper solutions are apt to do the mucous membranes more injury than benefit.

For the cystitis and dysuria, which are sometimes troublesome, hexamethylenamin and tincture of hyoscyamus are beneficial, or if the urine is excessively alkaline, ammonium benzoate may help. Mild alkaline washes, which may contain a small percentage of menthol, will usually aid in giving relief to vaginitis, especially if used as warm as can be comfortably tolerated. When a true nephyrtis develops it should be treated as any other toxic irritation of the kidneys.

Attention to the digestion and feeding will sometimes have a beneficial effect upon the

milder pschycoses, but where these become more severe, medication has but little value, although hydrotherapy may offer some assistance. In the comparatively rare occasions in which active or violent delirium may be present, recourse may be had to such sedatives as the bromides, opiates or even hyoscine in the order named. More frequently, especially during periods in which the other symptoms are in abeyance, or during convalescence, the glycero-phosphates alternated with strychnine will give some improvement in the general nerve conditions, but alcohol and other stimulants should be used sparingly, if at all.

A careful examination of the stool should be made in all instances, and if amoeba, uncinaria or other intestinal parasites are discovered, thorough measures should be instituted to exterminate them before any other treatment is attempted.

Insomnia is sometimes very troublesome and difficult to control, and it is not wise to push the ordinary hypnotics excessively on account of their secondary depressive action. Warm baths, massage, trional, sulphonal and chloral butylhydrate with tincture of passiflora may be tried in the order named. In other cases the sleeplessness may be due to exhaustion and better results obtained by giving the patient a glass of hot milk and a hypodermic of strychnine with a small dose of atropine just before bedtime.

Where there is a great deal of inanition, the use of gradually increasing doses of thyroid extract for a few weeks has seemed to be of benefit in a few cases reported to me, but I have not had the chance to try this remedy as extensively as I hope to.

Winthrop and Cole have reported very favorable results from transfusion in some cases which were refractory to other forms of treatment, and without doubt this plan is destined to be much more widely adopted in the future than it has been in the past. It is probable that transfusion from any healthy person will be found to be as beneficial as if the blood had been taken from a patient apparently cured of the disease, and we must still question the desirability of abstracting blood from a patient who has only recently had the disease.

In this country we have as yet scarcely had time enough to determine just how long a pellagrin must go without showing any symptoms before we can consider him cured, but I believe it will be wise to continue treatment every spring for several years after all symptoms have disappeared, and in all instances in which their financial condition permits, it will be wise to send them to a cold climate during the summer. Indeed, it would seem that a cold climate is beneficial to all stages of this malady, and I hope, if possible, next year to attempt to try the effect of artificial cold, such as is afforded by some of our larger cold storage plants.

THE NEW ANTISEPTIC.

This Journal does not undertake to say that the new antiseptic, Chinesol, will do all that is claimed for it. In spite of the fact that the A. M. A. Council on Chemistry and Pharmacy has investigated it and pronounced it non-toxic, and as an antiseptic equal to mercuric chloride and superior to phenol the profession has been a little slow to adopt it. It does not seem reasonable that any substance which is absolutely not poisonus can be an antiseptic in a 1 to 5000 solution, yet that is what is claimed by the manufacturers and acknowledged by the Council.

This is no "reading notice" or other form of advertisement. Only because the antiseptic is new and proposes to be the most valuable one in materia medica, do we deem it our duty to suggest that doctors everywhere try it, and see for themselves Only clinical demonstration is final. It is up to us to make it, one way or the other.

THE PROGNOSIS OF PELLAGRA.*

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The prevailing opinion of the laity and most of the medical profession in this country as to the prognosis of pellagra results in unnecessary alarm and harm to many patients and in great confidence being placed in many supposed remedies and cures, most or all of which are perfectly useless and quite a few no doubt harmful.

Lavinder and Babcock, in their translation of Marie, very correctly point out that the statistics in this country are based on asylum cases, and therefore the least hopeful, frequently having at the same time other hopeless diseases. It is a fact also that most of the cases in private and hospital practice from which we have formed our opinions as to prognosis are those diagnosed by a profession unfamiliar with this newly recognized disease, and the mild and moderate cases which we are just now beginning to recognize are not included in most of the statistics now available.

Of all the cases of pellagra I saw in New Orleans in 1909 over 50 per cent died during the year. Of ninety-six cases seen this year, 1911, only four have died, and with the coming of cold weather none of those now under observation would be expected to die. This changed condition, though due partially to the milder type of disease prevailing in the section around New Orleans, is due chiefly to the fact that mild cases are now recognized, whereas formerly only the severe and frequently hopeless cases were recognized.

The very nature of the cause of pellagra is different from what we are accustomed to in infectious diseases, such, for instance, as typhoid, smallpox, pnuemonia, measles, etc. In these the cause is a specific living organism which multiplies, elaborates its toxin, and is limited in its multiplication and disease production by the natural and acquired protective agencies of the body. Finally, after a fairly definite period, varying with the nature of the infection, the body cells acquire the ability to neutralize and destroy the living organism and recovery may take place. Such diseases run a pretty definite clinical course, varying slightly with the immunity processes of the individual patient. In the case of pellagra, on the other hand, the cause of the disease appears to be a definite pre-formed toxin that may be taken into the body in quantities varying from an infinitesimal amount up to the lethal dose. This may have been taken in one dose or it may have been taken in small doses repeated over longer or shorter periods of time.

Though the toxin is organic and possibly bacterial in its source, it probably does not increase in the body. Each individual patient gets a different amount of toxin and would, therefore, so far as this goes, have symptoms accordingly.

This primary, essential cause of the disease, however, does not govern the symptoms and prognosis in a given case any more, in my opinion, than do the secondary or exciting causes of the symptoms and lesions. A patient may have ingested the toxin for weeks or months, whereby his entire epithelial tissue loses, to a greater or less extent, its natural resistance to ordinary physical forces such as bright sun light, heat, pressure, chemical and otherwise nontoxic substances, etc., but as long as the tissues (skin and mucous membrane) are not exposed to these influences little or no harm is done. Exposure to such influences

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not only precipitates the development of skin lesions, but these are accompanied and followed by nervous manifestations and accentuation of all the other symptoms. The severity of the present symptoms in a given case is therefore a valuable guide to the prognosis. Mild and moderate symptoms after an attack had existed for at least two or three weeks would indicate that the chances of recovery from this attack are good. These chances increase with the duration of the attack and decrease with the severity of all the symptoms present. Whenever an attack is certainly improving or is mild, or during the interval between attacks, the likelihood of the recurrence depends largely upon the patient's ability to avoid the chief causes of the attacks, such as corn food, sunlight, hot seasons, indigestible food, etc.

Here may be asked the question how long must a patient be free from attacks before he is safe from a return. My observation would lead me to answer that if an attack can be avoided for twelve months or longer there is little danger of a return of the disease, provided all corn food has been avoided during the time, and that it is never resumed.

Another guide to the prognosis in a given case is the condition of the reflexes. Whenever the knee jerks are exaggerated as they are in all moderate and early cases, indicating irritation of nerve tissue, it is always possible for the patient to recover. On the other hand, whenever the knee jerks are absent (barring other causes) the case is beyond the hope of recovery. Personally, I have never seen but one such patient improve, and it was not known whether he had ever had normal knee jerks.

The so-called typhoid pellagra seldom but occasionally gets well. Pellagrous insanity is unfavorable, but does not bar recovery. Deep moist lesions are an unfavorable symptom. Severe stomatitis, indigestion or diarrhoea may produce death by starvation. Other associated diseases render the prognosis of pellagra less favorable in a given case, according to the prognosis of the partinular diease.

In conclusion, I would point out that in Italy and Roumania, where the pellagra has been recognized for a long time, and the medical profession is therefore familiar with it, the mortality is considerably less than 10 per cent of all cases. So far as my experience goes, the type of pellagra seen in New Orleans, and coming chiefly from Louisiana and Mississippi, has a mortality not exceeding 5 per cent for all cases. As in tuberculosis and many other diseases, much depends upon early diagnosis.

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OBSERVATIONS ON PELLAGRA IN ITALY.*

By HERBERT P. COLE, M.D.,
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The ceaseless investigations of Lombroso and the other Italian scientists warrant our deepest consideration in accepting a theory concerning the etiology of pellagra. Though there exists some dissension among these investigators as to the exact agent producing changes in the maize, nearly all of them are united in the theory that the disease is caused by the ingestion of maize products in which some toxic substance has been formed through chemical or biological agents.

The recent action of the Italian and Austrian governments in attempting to eradicate pellagra in the more affected districts through state inspection of maize products may be cited as an example of pellagra prophylaxis based upon the maize theory. The results of this campaign together with the results of the

*Read before the Southern Medical Association, Hattiesburg, Miss., November 15, 1911.

state distribution of meats and vegetables in the affected districts should serve as a fair therapeutic test of this theory.

To ascertain the results obtained I visited the northern provinces of Italy and the neighboring Austrian Tyrol in August of last year. This south-central portion of Europe has been one of the most severely affected pellagra areas, and the results of any successful methods applied to this area might be assumed to be applicable to less severely affected sections.

At Milan, the center of this area, I had the pleasure of interviewing Dr. Carlo Bezzola, director of the Institi Clinici di Perfessionamento (the Governmental Institute of Medical Research), a man widely known by his scientific attainments, and eminently qualified to discuss the pellagra situation. He stated that there has been a marked decrease in the prevalence of the disease in the formerly severely affected provinces, and that the Italian pellagra of today bears in general little resemblance to the pellagra of former years in the matter of severity or mortality. He attributes this change in the situation to the state inspection of maize products and the distribution of meats and vegetables throughout the pellagra districts during the seasons of prevalence.

At the suggestion of Dr. Bezzola, I visited the town of Rovereto in the Austrian Tyrol, bordering upon Italy. This district was one of the only two in the entire area where there were formerly thousands of cases, where Dr. Bezzola believed that I would be able to find actual cases for observation. Through the kindness of Dr. Augusto Bresadola, the assistant physician, I examined the cases in the Pellagrosarium, a modern hospital maintained by the Austrian government for the treatment of pellagra.

Here again I found confirmation of the report of the marked decrease in the incidence and the marked amelioration of the symptoms of pellagra. Here also this result was attributed to the same measures undertaken by the state.

There has been a rapid diminution in the number of hospital admissions in the past year. The cases admitted presented almost without exception only mild nervous symptoms, and very rarely sysmptoms of involvement of the gastro-intestinal tract. Of the forty patients in the hospital, I was especially impressed with the fact that not a single case presented the severe gastro-intestinal, dermatitic or grave mental lesions so frequently seen in America. Many of these cases would have passed as simple mild cases of mal-nutrition. There was a moderate increase in the superficial reflexes in some and occasionally evidence of a former dermatitis. Many were mild recrudescences of attacks of several years' duration.

The hospital treatment does not differ essentially from the usual treatment in this country. The cases are subjected to thorough hygienic measures, dietary measures, elimination to a great extent of maize products and the administration of iron and arsenic in various forms. The cases usually remain in the hospital from one to two months and return to their homes cured or markedly benefited.

Having discussed the Simulium reptans theory with its author, Dr. Sambon, in England, before visiting Italy, I was very much interested to note that the Italian authorities with whom I discussed that theory almost without exception gave it no credence, maintaining that the interesting maps compiled by Dr. Sambon showing the distribution along the water routes did not correctly portray the situation.

In conclusion, we feel that there is a very general acceptance of the maize theory in Italy; that their medical treatment offers no specific and differs in no essential respects from our own; that the pellagra in general is of a less severe type than is seen in America, and that the results of the prophylactic meas-

ures undertaken by the state serve to confirm the Italian investigators in their theory of the ingestion of toxic maize products as the essential etiological factor in pellagra.

WHEREIN THE DIAGNOSIS OF PELLAGRA IS OF SURGICAL IMPORTANCE

By LE GRAND GUERRY, M.D.,
Columbia, S. C.

The medical profession of America owes a very distinct and, at the same time, a great debt of gratitude to Dr. J. W. Babcock, of Columbia, S. C., for first calling attention to the existence of pellagra in this country; he not only called attention to the malady, but described it, named it, recognized it, and proved its existence. Until a short while ago this disease was only known as a curious name printed in some of our textbooks; now we know that the disease has existed in this country for nearly one hundred years; we know that in some sections, especially in the south, the number of cases has reached almost epidemic proportions. The condition is of such importance that both the State and Federal governments, in many instances, are working together in an effort to solve the riddle of its cause. Before I can be justified for bringing such a subject as this (generally thought of as an entirely medical malady) to the attention of a special surgical organization, two things must be proven; first, that pellagra is of general interest. In support of the first proposition, we submit the following: That pellagra is of interest to medical men living in states other than the strictly southern states is proven by the fact that cases have been reported from and are known to exist in about thirty-eight states of the union; for example, Massachusetts, New York, New Jersey, Pennsylvania (at the Philadelphia Hospital for the Insane, "Blockley," a very interesting focus of infection has been discovered), Kentucky, Iowa, Kansas, California, Ohio, New Mexico and Colorado. At the present time there are, at least, three hundred cases in the state of Illinois.

Dr. C. H. Lavinder, one of the government men detailed to investigate this problem, says that twenty-five thousand is a very low estimate to place on the number of cases existing in America today. To make a long story short, pellagra exists from the Atlantic to the Pacific and from Canada to the Gulf of Mexico. This is no careless statement, but an accurate one entirely susceptible to demonstration and proof; a disease, therefore, so widespread must surely be of general interest to the medical profession; we feel safe, then, in announcing the general proposition that pellagra is of such interest, and leave it with you to determine whether or not this part of my case has been made out. Second, it is now incumbent upon me to show, surgically, that there are cases, quite a number of them, both acute and chronic, that can be and are mistaken for surgical conditions.

Pathology.—This is from an autopsy report of one of Lombroso's cases. Oedema malleoli and decubitus. Cerebral convolutions slightly atrophic; floor of fourth ventricle anaemic, heart and aorta slightly dilated, aortic segment thick, lungs oedematous, spleen and liver congested, both had spots of fatty degeneration; kidney soft, cortical substance very thin; bowels atrophic, muscular coat and intestinal mucosa very anaemic; hypertrophy of the salivary glands, mesentery glands reddened.

Spinal Cord.—The inside dura appeared to be polished; the pia was thick and opaque,

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especially on the dorsal surface; on the arachnoid were many hard, small placques that resembled bone; meninges were hyperaemic. The consistency of the cord was decreased in the cervical region; the gray matter resembled, in one section, commencing decomposition. Microscopical examination of the cord showed degeneration of the pyramidal tract. This lesion was symmetrical from the site of the fifth pair of cervical nerves, and increased as it descended the cord with maximum at the lumbar vertebrae. On this pair very few nerve fibers were preserved, the nerve fibers being replaced by sclerosed nerve tissue. The posterior columns are very slightly affected and limited to the column of Goll and a few fibers of the column of Burdach. This degeneration stopped at the first cervical nerves where the sclerosed nerve tissue could not be seen. The ganglion cells of the gray matter, especially on the anterior cornu of the dorsal region were atrophic, very pigmented. The principal pathological lesion was in the spinal cord, and the pyramidal tract had suffered most; next the ganglia as well as of the anterior cornu.

Symptoms.—I shall give a very brief description of the symptoms and refer those interested in this subject to a splendid article by Dr. Watson on the symptomatology of pellagra, published in the International Clinics, volume one, series 20. The symptoms here given are culled almost entirely from this paper.

First Digestive Disturbances.—"The buccal mucosa becomes very red, the tongue and mucosa of lips showing particularly this characteristic symptom. If the throat is examined this redness will be observed as far as one can see into the pharynx. Flakes of exfoliated epithelium will be seen adhering to the gums, and the tongue, being denuded of its epithelium, is smooth and glistening. Its color being a cardinal red, and it being a cardinal symptom of the disease, I have denominated it the cardinal tongue."

Stomach.—Stomach symptoms may at times be most pronounced. "The acme of the stomatitis corresponds in point of time and severity to the acme of the eruption on the hands. Other mucous membranes are also inflamed, proctoscopic examination revealing a bright red mucosa as far up the gut as can be seen" (Watson). There are also gastric crises, with occasional hemorrhage.

Diarrhoea.—Diarrhoea is almost always present during some part of the disease, varying in intensity and degree; sometimes the stools contain both blood and mucus.

Pupil Symptoms—Pupil symptoms are at times very marked and pronounced in their variations, due probably to the involvement of the cilio-spinal center, which is situated in the cord between the first and second dorsal vertebra, a part of the cord always involved in the disease.

Temperature and Pulse.—Temperature and pulse depend upon the severity of the infection; high temperature and rapid pulse belonging to most malignant and fatal infections.

Psychic Phenomena.—"Briefly, mental depression is as constant as the erythema and diarrhoea, and varies from a mild case of the 'blues' to severe melancholia" (Watson).

Skin Eruption.—The skin eruption is characteristic of the disease; the only trouble about the eruption is that it is frequently a late symptom and occasionally does not occur. If it were a constant and early symptom mistakes in diagnosis could hardly occur. It is an erythematous rash, closely resembling sunburn and occurring on back of hands and feet exposed to the sun.

So much, then, for the symptoms; now to our real undertaking. A malady with the symptom complex of digestive disturbances, stomach symptoms diarrhoea, psychic phenomena etcetera can, in the atypical case, be mistaken for anything. We know, for example, that the poison of pellagra is especially liable in women to involve the female pelvic organs. "In the early cases we have

all the train of symptoms: backache, pelvic distress, headache, bearing-down pains, weakness, lassitude, emaciation, ovarian and menstrual disturbances, which are seen in pelvic disease, for, as Manton well says, mental symptoms are present in gynecological cases.

When the eruption is not present the unsuspecting doctor or consultant is most likely to pronounce the case pelvic and treat the symptoms as pointing to a primary gynecological trouble without thinking of its being a part of the pellagrous symptomatology. Here, too, the mental depression is regarded as merely a symptom of the pelvic disease, and operation or special treatment is advised. The consultant neglects to ask for a history of the eruption for one year, or maybe for four or five years, and at the same time there is perhaps a very red tongue, swollen and indented with stomatitis, which he overlooks or diagnoses and treats as ptyalism and disregards the severe wasting diarrhoea with increased kneejerk, pupillary anomalies, marked atheroma, enlarged epitrochlears, dorsal pain and "nervous dyspepsia." I am compelled to say that cases of so-called post operative insanity admitted to this asylum point to this conclusion, for in the spring and summer of 1908 we had, as we do every year, many such cases, which showed all these symptoms of early pellagra and gave histories of former eruptions and diarrhoea. To cite an unusual occurrence, but striking coincidence, in one week, we admitted five cases of pellagra, which had been operated on for gynecological trouble within the preceding two months, and all of these at the time of admission had or developed within a month the typical objective pellagrous stigmata. Three of these five died and two went home recovered.—Dr. Saunders of our State Hospital for the Insane.

It has been known for three hundred years that pellagra can and does cause uterine hemorrhage, varying from mild to a very severe degree. Old women, for example, not only in this country but abroad, have had hysterectomy done for pellagrous hemorrhage under the false diagnosis of cancer. In this connection I cannot resist this question: How many neurotic and much operated on women, the proverbial gynecological cases who have suffered from many physicians, including a D. and C., R. V. O., suspensio-uteri etcetera, movable organs and fixed organs removed still not relieved, may be chronic pellagrins? I have personal knowledge of a number of such cases. My experience is as follows:

Case I.—Mrs. ——, aged forty, married, several children, was sent to the hospital for diagnosis and operation, if necessary. There was marked anaemia, loss of flesh and emaciation; haemaglobin, thirty per cent; there was definite pain and rigidity over the pylorous, blood in the stomach contents and in stools; no tumor could be felt; the gastric analysis showed positive interference with motility, blood, entire absence of hydrochloric acid.

We considered such a case as having symptoms sufficient to warrant an exploration; this was done. All that was found, however, was a red and inflamed stomach and intestinal tract; the case was closed. Several days later when the patient was rolled on the porch and placed in the sunshine the typical eruption was brought out on her hands. Drs. Babcock and Watson were called in consultation, with the result that the case was finally pronounced pellagra, which diagnosis was correct. The patient was sent home and died several weeks later, presenting a classical picture of pellagra.

Case II.—A young, vigorous child, taken suddenly ill with acute abdominal pain, with general abdominal tenderness and rigidity, but most marked over McBurney's point. Temperature 102 degrees, pulse 120. Two pellagra experts saw this case and advised operation. On opening the abdomen the appendix was found slightly inflamed, but entirely inadequate to explain the severity of the constitutional symptoms. Five days later when the eruption occurred the real cause of the trouble was revealed. This case recovered.

Case III.—Mr. ——, a middle-aged man, with a history extending over a number of years of some chronic abdominal trouble; he had been under the treatment of numerous doctors, and I saw him in consultation with a doctor of unusual ability, and who was an expert on the question of pellagra. For some time previous to the consultation he had developed symptoms, that, to us, seemed to indicate clearly either a high up chronic appendix or an inflamed gall-bladder. As every other means had failed to give relief operation was advised and accepted. Although the appendix was removed and the gall-bladder drained, all of us felt that what was found did not explain his trouble. He was kept in the hospital for a long time under observation. While there he developed a very mild pellagrous rash on the back of his hands, which settled the question of diagnosis. Proper dietetic and hygenic treatment directed by this medical attendant put him in better condition than he had been for years. This patient, a most intelligent and educated man, then wrote for us, in his own way, a history of his trouble for several years, and it filled exactly into the symptom complex of pellagra.

Another point of importance is that in the future we must reckon with pellagra as a causative factor in intestinal hemorrhage of obscure origin. We also have to look at these cases from the standpoint not only of diagnosis but it is important to remember that these cases are living on a very narrow margin of safety, and that even when surgery is imperative for other conditions that may arise they are extremely poor surgical risks, and the mental symptoms can be and have been greatly exaggerated by anaesthesia and operation, occasionally being followed by acute insanity, from which they never relapse, but die.

In conclusion, it is most important to keep in mind that there are both acute and chronic cases; cases with and without eruption; that the onset frequently is most insidious and atypical; that the disease is a malady as protean as malarial fever, tuberculosis or hysteria. This final point we wish to emphasize, that as our knowledge of pellagra, the disease, increases and the pellagra zone widens, we should keep in mind when dealing with cases similar to those given above, the pellagra syndrome.

PELLAGRA—A SOCIOLOGIC AND THERAPEUTIC STUDY.*

By GEO. M. NILES, M.D.,
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A number of years ago the late Grover Cleveland uttered the epigram, "A condition and not a theory confronts us." This might well apply to the present situation in regard to pellagra.

Three years back this disease appeared as a cloud no larger than a man's hand, but it has continued to grow until it now looms on the sociologic horizon with portentous solemnity.

It is probable that pellagra has existed sporadically in this country for at least fifty years, perhaps longer.

Dr. Kerr, of Corsicana, Texas, an assistant surgeon at the old Andersonville prison, believes that an epidemic of pellagra prevailed among the Federal prisoners there in 1864, and was responsible for many deaths.

According to Dr. J. W. Babcock, of Columbia, S. C., to whom, in this connection, I acknowledge valuable information, statistical

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and otherwise, Dr. Sloan, a former physician in the South Carolina Asylum, says the disease was recognized there in the early '70's.

Charleston physicians admit that pellagra occurred in their city fully twenty years ago.

In New Orleans, the late Dr. Bemis left a written diagnosis of a case in Charity Hospital in 1889.

There occurred in my own practice nineteen years ago an illness in a mulatto girl, who in the third recurrence died. In the light of my present experience I am positive that she had pellagra. I also well remember two other fatal cases over twelve years ago—one under my care and another under a confrere —who undoubtedly had pellagra in its typical form.

In Italy pellagra has been observed for more than 170 years, and has been noted as a disease of peasants, limited practically to those regions where Indian corn formed the chief article of human food.

In 1735 it was observed in Spain, in 1762 in Italy, in 1829 in France. South Austria and the Balkan States have suffered, and lately it has appeared in Egypt.

Italy seems to have suffered more than any country, for in 1881 the nine regions of northern and central Italy, with a population of 16,000,000, officially reported 104,000 pellagrins, or one in sixty, and some regions, like Venetia, one in nineteen.

This startling condition I learned from a consular report of W. Bayard Cutting, Jr., Vice-Consul at Milan, November, 1908.

As previously stated, the pellagra situation caused no concern up to 1908, but since that time we seem to have entered into an epidemic of this disease, the outcome of which is most uncertain.

Cases have been reported from thirty-six States, and when the full returns come in no doubt every State in the Union will be forced into the dubious distinction of admitting its presence.

The New England States and those in the Northwest have reported but few. Illinois acknowledges the presence of 250, while Pennsylvania reports 33. Virginia, North Carolina, South Carolina, Alabama and Mississippi report over 200 each, while Florida admits only 50 cases—rather a peculiar report. Perhaps a present bulletin would be different, for I myself have seen nearly that number from Florida in the last twelve months.

These cases were reported something over a year ago, and fifteen months ago an estimate made by health officers and asylum physicians in this State placed the number in Georgia alone at 670.

As in all diseases where doubt and dread prevail, many wild and misleading rumors have been perpetrated, some alarmists claiming that there were 50,000 cases in Georgia alone, and over 1,000 cases in our State sanitarium at Milledgeville.

To show the utter absurdity of such a claim, I wrote direct to Dr. R. C. Swint, one of the resident physicians at the sanitarium, and his reply of September 8 informs me that there are at present 50 cases in that institution.

My own estimate would place the present number in Georgia at between one and two thousand, and I feel that I have studied the situation with considerable care.

The present outlook is far from bright, though Dr. C. C. Bass, of New Orleans, in a recent letter, expressed the optimistic opinion that we are now having our worst experience with pellagra, and he expects methods of prevention and education to soon successfully solve the problem.

One difference has impressed me between pellagra in our country and Europe. There it is mainly among the rural and agricultural peoples, and principally among the poorer classes of those. With us in the South, it seems to show but little distinction, attacking with sinister impartiality the dwellers in crowded cities or sparsely settled rural dis-

tricts, the poor and the rich, the rude and the refined.

One of the worst cases I have seen was that of an intelligent and cultivated young lady, the petted darling of wealthy parents, and who had never in her life known the stress of care or responsibility.

I have at present under treatment a lady from an adjoining State, who has been a leader in her community in questions of both education and sanitation, and whose magnificent physique it seemed would have rendered her immune.

As to the susceptibility of the different races I cannot as yet speak definitely, though it would appear that the African race is not developing pellagra to any great extent.

One feature of mournful importance is the frequency of mental symptoms among these victims. To understand and control the psychic manifestations is often the major task, and, taken in the aggregate, is one of the main sociologic problems. As Dr. Babcock remarks, "When we recall that, according to different authorities, from 4 to 10 per cent of pellagrins become insane, we can understand the significance of this disease to alienists as well as to sanitarians and publicists."

Before entering into the therapeutics, I wish to discuss some measures prophylactic and educational.

Until the etiology is thoroughly settled, preventive measures will be to a certain extent experimental, but the preponderance of proof up to this time favors the theory that pellagra is caused by a toxin generated in spoiled maize, and until this theory is exploded I feel that it is our duty to exclude corn products not only from the dietary of our pellagrins, but also from that of our insane asylums generally.

It would appear, too, that a most useful field of activity for our State Department of Health and the Department of Agriculture, as well as the national officers charged with enforcing the pure food laws, if all corn shipped in from a distance was forced to undergo a strict censorship.

There are a number of tests, chemical and otherwise, by which spoiled corn can be detected, but most of these are not available for the public at large, properly coming within the province of experts.

Such outward signs as mildew, or the smell of mold, are, of course, conclusive, but they can be removed by drying in the sun, and their absence does not prove the soundness of the grain. People, however, should be warned against any corn that is covered with dust, that is damp to the touch, or that gives forth any smell of mold when warmed in the palm of the hand. They should also be on their guard against corn of a pale color with a dull surface.

One of the apparently successful prophylactic measures used in Italy is artificial dessication. Objections to this have been many, the objectors claiming that the loss in weight was great and the germinating power of the grain destroyed.

This is true only when the drying is improperly done.

There are two types of dessicators—fixed and portable. The portable has the advantage of saving the transportation of corn, but is not as economical in its operation.

In a stationary dessicator, designed by an Italian, Cattaneo, air heated by a furnace is forced by a ventilator into a chamber of seven stories. Each story consists of a circular revolving wire tray containing about 1,400 pounds of corn. The top is filled from above, and after a certain time its contents, by pressing a lever, are emptied into the tray below in such a way that they are thoroughly mixed. The corn thus gradually passes to the bottom tray, whence it goes into a receptacle where it is cooled by means of a ventilator, and thence out of the machine by an inclined plane.

The first tray load of corn takes seven hours to pass through the machine; after that 1,400 pounds come out each hour.

The cost of this machine is about $540, and the power required to run it about 2½ horse-power.

Public dessicators are now numerous in Italy, their presence being necessitated by both laws and public opinion.

Should salutary laws be enacted with us, requiring dessication of all corn placed on the market for human food, I venture the opinion that pellagra would decrease with gratifying rapidity.

I admit that some intelligent students are decidedly anti-zeist in their views. Individually, while I am zeist in my convictions, my mind is open to proof, and I shall gladly welcome findings as to etiology when supported by acceptable evidence.

The treatment I have formulated, and which I reported two months ago, has varied in no material way. At present I am using ampules of iron arsenite solution (16 minims) and carcodylate of soda (1 c.c.), administering them hypodermically, one of each daily, and alternating them. I keep up the daily injection for about two weeks, after that giving an ampule every second day, but still alternating them. After the symptoms seem to be controlled, I continue one or two injections weekly (still alternating) for three or four months.

Internally I use the saturated solution of k. i. and Fowler's solution (five of the former to three of the latter), beginning with five drops in water three times daily after meals, and increasing one drop daily until symptoms of arsenical saturation are manifested. This generally comes on when from twenty to thirty drops of the combination are being taken. When there is puffiness under the eyes on arising I stop the drops for two days, beginning again at the minimum dose of five drops and increasing one drop daily as before. Should there arise a gastric or intestinal intolerance, a condition occasionally in evidence, it may be necessary to reduce the Fowler's solution to one or two in eight parts, instead of three as originally suggested.

For the frequent diarrhea I have obtained satisfaction from bismuth-bethanaphthol and resorcin, given with milk of bismuth as a vehicle. This failing, I give tannigen, protan, or heavy doses of bismuth subgallate, or, as a last resort, powdered opium.

For the occasional constipation, either castor oil or enemas will serve, drastic cathartics being inadmissible.

For the sore mouth, a solution of thymol, one grain to the ounce of water, a little alcohol being used for a solvent, will generally prove sufficient. Also a 25 per cent solution of boroglycerin is helpful. For the aphthous spots in the mouth or on the lips or tongue, daily touching with silver nitrate in water (20 grains to the ounce) is in most instances efficacious.

Where there is a paucity or absence of free hydrochloric acid in the stomach contents, a lavage every alternate day with a 1-1000 solution of boracic acid, sodium salicylate, thymol or ichthyol may be employed to advantage. When these medicated douches are used, however, it is well to start with a mild saline solution, then the medicated fluid, then conclude with the plain water.

Special treatment of the psychic symptoms, appearing as they do in such weird variety, will not be discussed in this paper, as it would lead into a branch of therapeutics properly belonging to the alienists.

The simple erythematous rashes on up to sloughing condition of the hands or feet may be alleviated or cured by the bland ointments, such as oxide of zinc ointment, or 5 per cent ointment of boric acid. Avoidance of the sun's direct rays, or even very bright light, is advisable during the continuance of the erythema. For the intense burning of the hands and feet, so often and bitterly complained of, either compresses saturated with a mild solution of bichloride of mercury, ice cold and

applied at frequent intervals, or baths in hot mustard water may be ordered. There may also be used for this burning a lotion of powdered calamin and zinc oxide with an abundance of lime water as a vehicle.

Dietetic regulations depend altogether on the state of the gastro-intestinal tract, or as to the presence of constipation or diarrhea and need not vary materially from the same regime instituted for the same manifestations of digestive trouble set up by other diseases. Speaking generally, a liberal diet is indicated, the flesh proteins being especially well borne. I also venture the statement that the diarrhea appearing early in the course of pellagra is of central origin, and, to an extent, compensatory. It would naturally follow, therefore, that a diarrhea of this sort need not entail a too limited dietary. Later on, when the diarrhea has become inflamamtory, the physician may to advantage eliminate articles of food containing much cellulose, or yielding after digestion a residue of irritating particles. In any event, so far as is consistent with local conditions, the patient should be nourished to the limit of assimilation.

The medical profession at large is fully alive to the gravity of this problem, and pellagra is now being studied by many of our brightest investigators. Free clinics for its treatment are being held in our Southern cities, while one hospital exclusively for this disease (the Tabernacle Infirmary Annex, Atlanta) is in operation, supplying a long felt want. Other institutions of the same character are a pressing necessity and must be established in the near future.

Under these conditions, I feel that it would be in order for the different medical organizations to endeavor to interest our State and Federal authorities, to the end that this widespread malady may receive the attention it deserves.

By the beneficent and concerted aid of these authorities, such epidemics as smallpox, yellow fever, Asiatic cholera and bubonic plague have been stamped out with amazing celerity, malaria is diminishing rapidly, diphtheria is practically under control, while typhoid fever bids fair to be eradicated in the near future.

Let us hope that advancing knowledge may as successfully dissipate the frowning shadow of this new and disquieting specter—pellagra.

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ARE THE JEWS IMMUNE TO PELLAGRA?*

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ETHNIC INFLUENCES.

The history of the Jews in Europe for many centuries following the dispersion, in the matter of health and sanitation, shows a marked and highly interesting contrast to that of the people among whom they dwelt. The solidarity of the Jews grew out of their aloofness to the Gentiles—a voluntary and frequently a compulsory detachment. They were among the people, but not of them. Asiatics in origin, they were essentially religious, alien in speech, in diet and in their general mode of living. Making no effort at proselytism, they were content with their natural increase. They preserved rigidly and as a sacred and inviolate heritage the customs, morals and manners of their ancestors.

Beugnot remarks in his Histoire des Juifs d'Occident: "Les juifs presentent le phenomene dune nation ecrivant toujours avec la meme purete dans un idiome mort et qui par consequent ne peut se perfectionner par l'usage. C'est que les juifs n'empruntent rien un milieu dans lequel ils se trouvent; ils gardent leur lois, leur religion, leur morale, la severite de leur principes." The laws for the self-govern-

ment of the Jews were practical, sane and sound. They were the formulated result of centuries of thought, tempered with experience and the accumulated product of the master brains of this intellectual race. Adherence to these wise laws brought about a conservatism which yielded, physically, longevity and greatly lessened susceptibility to certain forms of disease. The Jew built up around him a veritable wall of defense against hostile influences from without.

H. Behrend (Communicability of Disease from Animals to Man) states that many statisticians have declared that observance of the dietary laws has greatly contributed to longevity and the physical as well as the moral power of the Jewish race.

The mandatory laws of health fully detailed in the books of Leviticus and Deuteronomy strangely forecast modern hygienic methods. Purification of the person by ceremonial ablutions, isolation of those suffering from communicable and otherwise obnoxious disease, destruction by fire of refuse and unclean matters, the proper disposal of the dead, prescriptions and restrictions in diet were strictly enforced portions of personal and municipal hygienic regulations. "The dietary laws," says M. Friedlander (The Jewish Religion, London, 1891), "are exactly the same now as they were in the days of Moses."

On the other hand, the non-Jews, especially in mediæval times, if the descriptions of these times are to be credited, lived in a state of disregard of the laws of hygiene equalled today only by the Chinese. The Christian population ordered their diet by the antinomic axiom that "there is nothing from without the man which goeth into him which can defile him, but the things which proceed out of the man are the things that defile him." Mark vii, 15. The Gnostics held that we are as little defiled by meat as is the sea by tainted influxes.

Refuse of all kinds was thrown into stifling mews, there to be sorted by mendicants and worried over by pariah dogs. Municipal hygiene was non-existent. The floors of dining halls were strewn with straw or rushes, and half-eaten fragments of food were tossed carelessly down to be devoured by domestic animals, or left to fester until the stench was quelled by a stratum of fresh straw. Dwellings offered no means of bathing, an omission which reflects the habits of the occupants.

As a consequence of ignorance, overcrowding and filth, pestilence sprang up and swept the population before them by the thousand. Plagues of strange names and highly imaginative origin moved across the face of Europe, leaving death and desolation in their wake.

In many of these periodic visitations of epidemic disease the Jews showed a singular exemption. The Jews were so little affected by the Plague of the Black Death in the year 1340 that the stricken populace, noting their apparent insusceptibility, accused the Jews of having caused the pest by poisoning the drinking water, and as a result of this quite irrefutable charge there ensued a Jew-baiting which caused a mortality among them almost sufficient to offset their plague exemption. (Graetz—History of the Jews.) The Jews owed their comparative exemption in epidemics to their attitude of separateness, their mode of living and to their inherited vitality from abstemious ancestors. They applied to the conduct of their daily lives the sage counsel of their wise men, handed down unchanged from sire to son throughout the ages. In their sanitary relations to the Gentile population they offered a simile, the reverse of the usual, of a sound core in the rotten rind.

So long as the Jew adheres to the Mosaic laws he reaps the benefits to his race accruing from them—and longer—for even after he has broken away from the usages and traditions of his forefathers and gone into the Melting Pot, his inherited tenacity to life is still apparent and will doubtless endure for many generations.

"The Jews, the one human race of which

we know assuredly that it has persisted unimpaired, have been the most continuously and stringently selected of any race, I suppose, that can be named. Every measure of persecution and repression practiced against them by the people among whom they have lived has directly tended to the very end which those people least desired to compass. Other people found themselves prosperous through the efforts of their fathers; the struggle for existence abated; it was so to say as fit to be unfit as to be fit—with the inevitable result. This has never been the case with the Jews. They have always had to struggle for life intensely, and their unexampled struggle has been a great source of their unexampled strength. The Jew who was a weakling or a fool had no chance at all. The weaklings and the fools being weeded out, intensity and strength of mind became the common heritage of this amazing people." (Saleeby—Parenthood and Race Culture.)

The Jews of the present day are divided into two general classes, the Orthodox Jews (Sephardim), usually of Russo-Polish or German birth, and the Reform Jews (Ashkinarzim), of Spanish or Portuguese birth or extraction. These distinctions are not definitely fixed and refer more to the different degree of religiosity than to nativity.

The Orthodox Jews, as the name implies, are those who cling to a strict exegesis of the Mosaic law concerning spiritual and physical relations. They preserve more or less unaltered the customs concerning marriage rites, ceremonial observances, prayers, ablutions, fast and feast days, sabbatarian rules and regulations as to food. The Reform Jews practice a modification of orthodoxy.

It is with the question of the diet of the Orthodox Jew that we are here chiefly concerned, as this constitutes a signal and to us the most important distinction between the Jews and the Gentiles. The Reform Jews have largely abandoned the old dietary restrictions, maintaining that observance of them is an anachronism and no longer has significance, but tends to keep the Jews from association with their fellow citizens. In Rabbinical conferences from time to time a general revision or abrogation of the Mosaic laws has been sought.

In the Mosaic laws proscriptions of diet appertained principally to animal food, and an elaborate schedule appears concerning the kind of animal whose flesh was adjudged fit for human consumption; method of preparation, drinking of milk, prohibition of blood. The flesh of animals acceptable for food was called *kosher,* or clean, as opposed to that which was unclean, or *terefah.* Jewish conservatism is observed in the present day adherence to these distinctions between clean and unclean flesh.

This phase of the subject is interesting from a point of health, but scarcely germane to the present issue, as it is concerned not with the eating of meat but of maize.

Maize, though not forbidden, is an innovation, and by virtue of racial conservatism in the diet of the Orthodox Hebrew practically proscribed. The ancient Israelites subsisted largely on vegetables and fruit. None of an edible character was forbid, but there were certain restrictions observed, as, for instance, the eating of new corn (wheat) was forbidden until the second day after Passover. This prohibition was extended to all times and all places.

MAIZE OR INDIAN CORN.

Maize or Indian corn is thought to be a native of America, where it grew in the wild state, but it appears probable that the Indians had cultivated it centuries before the discovery of Columbus, who on the return from his first voyage is said to have brought the first grains to Europe. Its cultivation spread slowly in Europe, and, according to modern agricultural writers, by the following progression: Introduced into Spain at the end of the fifteenth century, it appeared in France and Italy one hundred years later; from Italy to Switzerland and Hungary; from Switzerland to the Rhine valley; from Portugal to Asia and

Africa. The present limits of corn cultivation (De Candolle) are 40° south latitude in South America, 54° north latitude in North America, and 50° north latitude in Europe. Being unknown to the ancient Israelites, maize naturally was not considered in the Mosaic or Noachian laws. These laws being in daily practice among the Orthodox Jews at all times and places, it is a matter of conjecture rather than of fact that corn has had little or no position in their dietary at any time in their history. I can find no mention of maize in Jewish literature consulted. The conjecture is strengthened by the reflection that the smallest deviation from rule and rote was frowned upon by the Orthodox Jews and that, therefore, the general adoption of an innovation was rendered very difficult. The Jews today are unable to explain why the flesh of certain animals, the hare, for example, is regarded as unclean. Obedience to custom and usage required distinction between clean and unclean flesh without apparent reason, and by a sort of anology, not being a cereal to be classified at the time of the formulation of the laws of Moses, corn has been quietly ignored by the Jews.

Careful recent inquiry among both Orthodox and Reform Hebrews has elicited the fact that corn products are scarcely ever eaten by them, and that, while there is no prejudice against them, usage dictates only occasional appearance of them upon Jewish tables. Wheat and rye bread are used almost exclusively on the ground of taste and preference, while articles compounded of meal are rarely seen. The frying of food, such as fish, fowl and the like, in meal is not a popular method of preparation and is seldom seen. It may be said in brief that the Jews eat corn very sparingly or not at all.

THEORIES UPON THE CAUSATION OF PELLAGRA.

Up to this point I have not alluded to the prime object of this somewhat elliptical study. The general remarks which have preceded are intended to show that in times past the Hebrew race has exhibited a certain measure of exemption in epidemic disease; that such relative indemnity was due to nature as well as nurture; that being eminently conservative, pursuing the same general course of conduct in ordering their lives now as in the past, the same protection is afforded them now as in the middle ages, and finally, what is more succinct and pertinent to the subject of this paper, that they do not eat or at least are very moderate consumers of that article of diet chiefly incriminated in the etiology of pellagra, that is, corn.

In this connection a brief consideration of the current theories regarding the causation of pellagra may not be inappropriate.

Since pellagra was definitely identified in this country by H. F. Harris, of Atlanta, in 1902 (Anchylostomiasis in an Individual Presenting all the Typical Symptoms of Pellagra —American Medicine, 1902), the disease has been assuming ever more formidable proportions until at present it may be said temperately to be a veritable scourge. Its geographical distribution is not fixed. It widens with the spread of diagnostic information. It is endemic and occurs in numbers in the following states: Virginia, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Louisiana, Texas, Illinois; endemic with relatively few cases in Pennsylvania, Maryland, Kansas, Arkansas, Oklahoma, Kentucky, California (Marie's Pellagra, translated by Drs. Lavinder and Babcock.) It is alleged that there are at present in the pellagrous zone in the United States 50,000 pellagrins. These figures are not susceptible of proof, as pellagra is a reportable disease in only two states and cases in general have not been recorded. But for all its very apparent inaccuracy the figure given may be near the mark. Unless one is led into generalizing from personal experience, it is evident that each year shows an appalling augmentation in the number of sufferers and the aggregate must swell the total to staggering figures.

In the period which shortly followed the recognition of pellagra in the South, that is,

when the multiplication of cases aroused a clamor for recognition, it was thought that pellagra was limited to rural districts and was essentially a disease of poor whites and negroes (*mal de misere*). It is now conceded that, while pellagra here as well as in Europe shows a predilection for the inhabitants of the country and small towns and villages, it may, and does, occur without regard to social status or environment. I have personally seen a number of patients, both old and young, who had lived all of their lives, or for a long time, in and about Atlanta and whose social position was eminently respectable. This remark must not be construed as an attempt at denial of the well established fact that pellagra makes its appearance chiefly among the rural and semi-rural population. There is no controversy over this, and it is only in connection with the employment of this fact as an argument to substantiate some theory of a *necessarily* rural origin that the circumstances of its occurrence among city dwellers may be introduced in rebuttal. It is also relevant to the notion of Jewish insusceptibility.

However familiar one has become with the course and symptomatology of pellagra, the precise origin of the disease yet remains to be revealed. Until this has been made clear, many of the problems relating to the disease must await solution. The immense amount of activity at present displayed in the study of the disease leads one to hope that the revelation is not far distant. *Quidquid latet adparebit, nul inultum remanebit.* As has been remarked, pellagra needs a Schaudinn and an Ehrlich.

The present day theories of the origin of pellagra may be briefly considered. They are three in number, the maize theory, Sambon's theory of parasitogenesis and the theory of the toxicity of semi-drying vegetable oils. The maize theory has by far the most adherents. They are called Zeists, from the botanical name of the cereal, *zea mays,* and had their stoutest champion in the late Cesare Lombroso. Lombroso devoted twenty-five years of his life to the patient and scientific investigation of pellagra. His conclusions are entitled to the highest respect.

Lombroso's theory of the cause of pellagra is succinctly expressed in the following terms: "In pellagra we are dealing with an intoxication produced by poisons developed in spoiled corn through the action of certain micro-organisms in themselves harmless to man." (Marie's Pellagra).

In the chapter on Etiology in the Lavinder-Babcock translation of A. Marie's Pellagra the maize theory is summed up in the following words: "It may be said that, while the real nature of pellagra still remains in doubt, there is nevertheless a firm and almost universal belief that the disease is in some way connected with the use of corn as an article of food—a belief so universal as to render its rejection well-nigh impossible except in the face of demonstrative proof to the contrary."

Sambon, in 1905, advanced the view that pellagra was due to a protozoon which occurs in pellagrous zones in Europe, the infection being conveyed by a blood-sucking insect, a species of sandfly, namely, *simulium reptans.* The simulium reptans is held as explaining the epedemiology of pellagra as the mosquito (anopheles) explains that of malaria. The theory of Sambon is one of analogy and is founded upon an alleged resemblance in the clinical course, symptomatology and response to arseno-therapy to such parasitic diseases as malaria, trypanosomiasis, kala azar. Sambon's theory, while ingenious, has but few supporters and is suggestive, but far from conclusive. L. O. Howard states that simulium reptans does not occur in the United States. He thinks that Sambon is wrong in his conclusions.

The theory of pellagrogenesis from the ingestion of semi-drying oils is thus set forth by its author, Dr. George C. Mizell: Linolin, a neutral fat, occurs in semi-drying oil and in one edible drying oil, namely, oil of poppy. These oils are poisonous and the oxidation products of linolin are capable of producing

pellagra. Consumed in large quantities, linolin is not changed in digestion and constructive metabolism and deposited as normal animal fat, but as linolin. Oxidation products of linolin consumed as such may produce a condition much the same as pellagra, but it is suspected that the linolin is first deposited in the tissues where, under certain conditions, it is oxidized into linolic acid, sativic acid, azaelic acid and ultimately into isolinic acid and aldehyde. These end products are suspected of being the cause of pellagra.

All theorists are at least agreed that the sunlight, especially the actinic rays of light, are provocative of the characteristic erythema or more properly dermatitis of pellagra. Who knows but that the future will show the cause of pellagra to be dietetico-chemical, predisposing and determining, thus settling the dispute of the jarring sects?

IMMUNITY AND SUSCEPTIBILITY.

In order to establish anastomosis between the several streams of this discussion a clear understanding of the terms immunity and susceptibility is desirable. The definitions and explanations to follow are taken from various text books on pathology. Immunity means the power to resist disease; susceptibility means lack of resisting power to disease. The terms are correlated in the sense of reverse interaction, as one is high, the other is low and the opposite. Immunity may be natural or acquired. Natural immunity is an inherited power of resisting disease, found in certain races of men and animals, as, for example, the immunity of the negro to yellow fever, of the white rat to anthrax. Acquired immunity is that form which is obtained after birth and may be active or passive. Immunity is termed active when it results from the action of cells within the body either in destroying or injuring pathogenic microorganisms; it is called passive when it results from the introduction of foreign substances, e. g., animal sera, into the blood. Active immunity is that which results upon recovery from certain infectious diseases and may be temporary or permanent or after inoculation with an attenuated virus or bacterial toxins without bacteria.

JEWISH IMMUNITY.

The details as to the relative morbidity and immunity of the Jews from certain diseases are meagre and somewhat conflicting. There seems to be but little doubt that the Jews show a markedly diminished susceptibility to tuberculosis and to alcoholism and narcotism. Of the first named H. Behrend remarks that the comparative immunity of the Jews from the tubercular diathesis has been recognized by all physicians whose special experience entitles them to express an opinion. It was first pointed out by Bowditch in this country. John B. Billings showed that the mortality from tuberculosis among the Russian and Polish Jews in New York, despite adverse conditions, was lower than that among any other race.

Alcoholism among the Jews is an almost unknown affection. Dr. Norman Kerr (Inebriety: Its Etiology, etc.) says of the Jews: "Extensive as my professional intercourse with them has been, I have never been consulted for inebriety in the person of a Jew, while my advice has been sought for this complaint by a very large number of Christians. In my opinion, their general freedom from inebriety in almost every clime and under all conditions (there are very few exceptions to this rule) is as much due to racial as to hygienic influences, and more to racial than religious influences. This extraordinary people has amid wondrous vicissitudes preserved a variety of distinctive characteristics and I cannot help thinking that some inherited racial power of control as well as some inherited racial insusceptibility to narcotism, strengthend and confirmed by various hygienic habits, has been the main reason for their superior temperance. . . . Of the strong impulse to alcoholism or other narcotism, I have never seen a case amongst this distinctive people."

To the example offered by history of Jewish

relative immunity to epidemic disease I have already alluded.

NOTABLE ABSENCE OF PELLAGRA AMONG JEWS.

I have for some time been impressed with the notable absence of pellagra in my Jewish professional patronage. Though laying no claim to Hebrew blood, I have drawn a large share of professional work, almost exclusively dermatological, from the Hebrew population. With the advent of pellagra and the rapid accumulation of experience with it, its non-appearance among Jews became very noticeable to me.

With a view of ascertaining the general applicability of this personal observation, I began an investigation which has now extended over several months. The method pursued to obtain appropriate data was by inqury through medical journals, prominent Hebrew publications and circular letters to physicians and institutions. As the disease apparently originated in the South, it was thought expedient to limit the investigation to this primarily concerned portion of the country. Letters were sent requesting information on the subject to physicians and insane asylums in the states of Virginia, North and South Carolina, Tennessee, Alabama, Georgia, Florida, Louisiana, Mississippi, Arkansas and Texas; a few were also sent to Kentucky following a newspaper paragraph which referred to the large number of cases of the disease in the Eastern Kentucky Asylum for the Insane at Lexington. In the interest of thoroughness every practicing physician in the states named should have been approached, but as this was a task of some magnitude it was thought sufficient to address an inquiry to one or more representative physicians in each town and city. The physician to whom the letter was sent would probably inquire among his professional friends for cases of pellagra in Jews in order to answer my question, and in this way many other physicians than those specifically addressed would give testimony in point, and thus the scope of the inquiry would be fairly comprehensive.

I received in all sixty replies to my circular letters. Only one of them contained direct information of an instance of pellagra in a Hebrew and one other led to the disclosure of two more cases of the disease. Fifty-eight of my correspondents had never seen nor heard of pellagra in a Jew.

Dr. J. J. Watson, whose name is so familiar in connection with the study of pellagra, had seen over five hundred cases of pellagra and had records of many more, but no case in a Hebrew. Dr. Isadore Dyer, of New Orleans, one of the original investigators of the disease in this country, has seen no instances of the disease among Hebrews. The first positive reply was received from Dr. R. L. Willis, Medical Superintendent of the Eastern Kentucky Insane Asylum, who informed me that there was only one Jew in their institution and she had pellagra. On further correspondence Dr. Willis was kind enough to furnish me with the patient's clinical history, which was as follows: "Mary Epstein, admitted June 13, 1909; nativity, Russia; married; aged 48 years; form of insanity, chronic mania; duration prior to admission, fifteen years. No positive symptoms of pellagra that we are aware of until the discoloration and eruption appeared on the dorsum of the hands and extending to the wrists about four weeks ago. No constitutional disturbance such as stomatitis, bowel or stomach trouble as we have in many other cases. We were in some doubt as to this case and called Dr. F. H. Clarke, who had had quite an experience in these cases, to see her, and he pronounced it undoubtedly pellagra. We have had some very severe cases, losing six out of forty-five. All are better except four or five. The symptoms were very marked in twenty-five or more cases."

Granted that the above was a genuine case of pellagra, a study of it will show that the patient had been insane for fifteen years on admission; that she had been an inmate of the asylum for two years, and had shown no sign of pellagra until the first of August, 1911. She

then developed, without constitutional disturbance, a discoloration and eruption (in reverse order?) on the hands, which was not clearly pellagrous to those who had been familiar with the appearances of the disease from personal contact with at least forty-five cases. The case was, therefore, atypical. We know nothing definite about the period of incubation or rather evolution of pellagra, but it is not unreasonable to assume from the clinical history of this case that whatever the nature of its origin may have been the disease found its sources in the institution of which the patient had been an inmate for two years. Going further, the patient being a Russian Jewess was probably of the Orthodox faith, and as such had subsisted on *kosher* diet. It is hardly reasonable to assume that in a non-sectarian state institution, especially as the patient was the only Hebrew inmate, that kosher diet was kept up after her admission or that her food differed in character or preparation from that of the other inmates. In short, there is very little in this case to disturb the hypothesis of very slight susceptibility of the Jews to pellagra. The patient was insane, taken from her normal environment, "ate the food she ne'er did eat," and as a result of these conditions her immunity, depending largely upon adherence to her religious customs, was overlaid and annihilated.

Through the courtesy of Dr. J. W. Babcock, whose work in pellagra is so well known and appreciated, I was enabled to obtain the facts in the case of a second Hebrew pellagrin, living in Milwaukee, Wis. I append the history of this case as given me under the date of September 23, 1911, by Dr. Harry Greenberg, who had the man in charge: "Herman Schatzin, alias J. Edelstein, 32 years old, married, Siberian refugee; in this country two years. Was admitted to the Medical Service of Mt. Sinai Hospital, February 18, 1910. Was referred to the Surgical Service soon afterwards and was operated on by me on March 5, 1910, for ulcer of the stomach. Ulcer was excised and gastro-enterostomy performed. Appendix was chronically inflamed and was removed. Left hospital April 11, 1910, considerably improved. Returned to the hospital April 17, 1910, with symptoms of high obstruction. Was operated on by me on same day for volvulus of the jejunum, held down by bands of adhesions. Was doing well, taking solid food and gaining in weight. May 23, 1910, he began having diarrhoea, oedema of the legs and general anasarca soon set in. Albumen and casts appeared in the urine and a peculiar rash, desquamatory in character, appeared on his body, more pronounced on the backs of his hands. He was now re-referred to the Medical Service, where a diagnosis of pellagra was made. He was seen by a number of men, including several dermatologists. In June I was called upon to tap his abdomen and withdrew three gallons of a milky-appearing fluid. He was growing worse until the latter part of September, when he began to improve and was discharged from the hospital October 23, 1910, in perfect health. I have seen him yesterday and he presents evidence of perfect health, and, in his own words, "feels better than ever in his life before."

It is unbecoming in me to express doubt upon the validity of the diagnosis of pellagra in this case, but anyone familiar with the disease will scarcely hesitate to agree that ulcer of the stomach and general anasarca are not prodromes, complications or sequels of pellagra. The diagnosis must have rested upon the eruption and an appeal again must be made to those familiar with the disease-picture of pellagra, whether or not a diagnosis based upon cutaneous lesions alone is justifiable. The prompt recovery is also not characteristic of pellagra.

Dr. Babcock, in a subsequent letter, recalled two cases in Jewesses seen ten years ago and upon whom he had made a retrospective diagnosis of pellagra; one of the patients has since died, the other is still living.

Waiving the question of diagnosis, these three living instances of pellagra in members of the Hebrew race are all of which I have been able to gain information after a fairly diligent search carried out in the manner described.

STATISTICAL.

The Abstract of the United States Census for 1910 gives the population of the States investigated as 22,390,934. The American Jewish Year Book for the same date gives a total of Hebrews in these States as 85,685, or .3 per cent of the general population. If there are 50,000 pellagrins, or more than .2 per cent of the population in the area investigated, putting against this the .3 per cent of Jewish citizens, a calculation shows that if the Jews were affected in equal measure with the non-Jews, there should be in the neighborhood of 200 Jewish pellagrins instead of the number actually found, which is 3, and one of these cases does not legitimately belong here, as it was extraneous and sporadic.

This calculation is given for what it is worth and with the full realization that very little can at present be proven by the aid of statistics. The latter are wholly unreliable as regards pellagra and incomplete as regards the *distribution* of the Jews throughout the various portions of the country affected. The essential elements of statistical proof being lacking, one cannot establish accurately the ratio of incidence of pellagra in the Jews in proportion to their presence in the general population. But would not this search have revealed the presence of a considerable proportion of 200 cases among Jews had such a number actually been in existence?

OBJECTIONS TO THE THEORY.

A weak point in the theory of relative immunity of the Jews to pellagra, in addition to its present insusceptibility to statistical demonstration, lies in the fact that the Jews as a general rule do not live in the country and small towns and villages. Against this it must be remembered that there are but few large cities in the South, and in none of them is it at all likely that there are more than two to four thousand Jewish citizens. The remainder is scattered irregularly among thriving towns of 2,500 to 10,000 and more inhabitants. It is an easy task to show that in the pellagrous zone towns of this size give their full quota of pellagrins.

Further objections may be made that in the present unsettled state of our knowledge of the etiology of pellagra, I have given an undue importance to the comparative absence of corn from the Jewish dietary and have made this the crux of the argument: that the theory is visionary in general and not supported by adequate data.

Much of these objections is unanswerable but for the rest I would make reply that the theory is at least plausible, if not demonstrable, inasmuch as there is no known fact in connection with pellagra which controverts it or even militates against it, and that the very striking absence of pellagra in Jews in my experience, and in that of almost every physician interrogated, offers strong circumstantial evidence of the validity of the theory.

The discovery of a few cases, though very few, of pellagra in Jews is sufficient to show that there is not an absolute racial indemnity. But that it is an exceedingly rare malady among them is an equally legitimate deduction. This great rarity of the disease, taken in connection with the historical facts of comparative exemption in certain world-wide epidemics in the past, relative immunity to certain common affections and pathological states as tuberculosis and alcoholism, the inherited vitality and tenacity to life—the equivalent of resistance to disease, the practical absence from their diet of articles of food almost universally believed to be responsible for pellagra, would serve to make the theory of racial (natural as well as acquired) *relative immunity* of the Jews to pellagra not unreasonable nor altogether speculative.

SOME OBSERVATIONS ON PELLAGRA.

By DR. W. C. BROWNSON,
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We know comparatively little of pellagra, despite the fact that it is one of the oldest of diseases, and that it possesses a wealth of literature rivaling that of tuberculosis.

The first description of the disease dates back at least 150 years.

Procopiu[1] tells us that it was described by Casal, a Spanish physician, in 1735. It appears that he studied the disease at about that time, but his book was not published until 1762, some years after his death. He did not give it the name of pellagra—that is an Italian designation, dating from a later period—but says that by the common people it was called "Mal de la Rosa."

Since Casal observed the disease in Spain it has been recognized and described in various countries of Europe. Italy is the country showing the greatest number of cases and having the most extensive literature on the disease.

In the United States pellagra is of a recent appearance. Sporadic cases have undoubtedly occurred here for many years, but it is only for the last four or five years that it has been known to be of frequent occurrence in the South. American literature may be said to begin with the paper by Dr. George H. Searcy[2] in 1907 on "An Epidemic of Acute Pellagra." This describes an outbreak studied by him the preceding summer at the Mt. Vernon Asylum for the Colored Insane in Alabama.

Later in the same year Babcock of Columbia diagnosed the disease at the State Hospital for the Insane and prepared a thorough report of the discovery, and the next year "The American disease was identified with Italian pellagra independently by Watson and Babcock."[3]

It is true that Dr. Tyler,[4] of Somerville, Mass., reported two cases in 1863; Dr. Gray, of Utica, one in an insane patient in 1864; Dr. Sherwell, of Brooklyn, one in 1883. These were but sporadic cases, and previous to their occurrence there is no reference to pellagra in our medical literature, but following Searcy closely came Babcock, of Columbia, later Wood and Bellamy, of Wilmington, and in a short time the profession in the South was alive to the importance of the disease in this country, though it took some time to realize its astonishing prevalence. Dr. E. J. Wood,[5] in a paper read before the North Carolina State Medical Association in 1908, said: "Certainly there have been thirty cases in North Carolina. It is probable, however, that the correct number will run into the hundreds." Now we have hundreds in a single county, and it was estimated that there were 50,000 cases in Georgia last year.

It would seem that with the voluminous literature at hand, both old and new, and with the practical experience most of us have had with the disease, that by this time we would have a fair general knowledge of the subject, but it is evident from recent articles that there are many misapprehensions existing in regard to the diesase; that our ideas on etiology and treatment (we might add diagnosis and prognosis) are widely divergent, and that our conceptions of the natural history of the disease need revising.

The etiology of the pellagra is still in doubt; it may be years before the cause of the disease has been definitely settled. Just at present the ancient idea that corn in some way is responsible for the disease is being vigorously assailed.[6] Still it hardly seems wise to dismiss the maize theory just yet as out of date and unproven. The conception that the disease is due in some way to the consumption of corn is no haphazard guess, but the result of much thought and many investigations car-

ried on by some of the most eminent scientists of Italy, supported by experiments in this country. Lombroso elaborated the idea and by his writings and by his vigorous influence did more to fix the impression in the medical and lay mind that pellagra is a disease due to the eating of spoiled corn than any man who had gone before him. Still, the idea was an old one before Lombroso's day, and any view as to the causation of disease which has endured for a century in spite of hostile criticism is worthy of profound respect at least.

Lombroso's theory was that pellagra "is an intoxication produced by poisons developed in spoiled corn through the action of certain micro-organisms in themselves harmless to man."[7]

The maize theory dates back as far as 1896. Marzari, in a remarkable work, contended that maize caused pellagra through its deficiency in gluten.[1] This, of course, is only of historical interest, but the conception of a chronic intoxication due to some poisonous alkaloid certainly explains the various manifestations of the disease, as well as does the theory that an animal parasite occasions the strange malady.

To some minds it seems quite clear that as syphilis has been proved to be caused by a spirochete, so pellagra must be due to some spiral organism. I have never been able to see any special analogy between syphilis and pellagra; the skin lesions are utterly unlike in the two diseases; the constitutional symptoms are quite dissimilar. Why should there be a similar cause in the two diseases?

Sambon's view that the disease is conveyed by the simulium reptans, while a very atractive one, is only theory so far, and the various arguments he advances in support of his contention that a sand fly causes the disease in Italy are not convincing when the conditions here are considered. According to Dr. Sambon, "Pellagra is linked to the running stream just as malaria is linked to the swamps."[7] Many, very many, of our Southern cases live miles away from any stream.

Sambon claims that it affects field laborers almost entirely; while true for Italy doubtless, here five-sixths at least of our cases occur in women and a goodly portion of the remaining sixth in old men who stay in the house largely and do no field work. As to a seasonal incidence, which is considered the strongest point in the insect-borne theory, acute manifestations may occur at any time from March or earlier to late October, as shown by the appearance of the characteristic dermatitis. The cycle of any sand fly could hardly cover as long a period as this, but the fact that the disease is met with in women and in old men almost entirely serves alone to nullify the similium theory so far as it applies to the occurrence of pellagra in the Southern United States. Because one believes in the corn theory, he is not required to denounce corn as an article of food. No one avers that the eating of sound corn causes pellagra. Let everyone exercise due vigilance as to the source of the meal he uses (grinding his own corn in a hand mill is the ideal precaution), then eat his cornbread in moderate amount without fear.

The theory that cotton-seed oil is the cause of pellagra has been advanced,[8] but the arguments in its favor seem weak, and the idea has never found many adherents, it would seem.

The latest explanation of the origin of the disease (one of the latest, I should say, for new views as to etiology constantly arise) is Alessasdrini"—that "pellagra is a parasite disease caused by a water-borne nematode worm." The arguments in its favor are much the same as those advanced by Sambon for the simulium. Alessandrini, however, "connects the disease with potable waters, and he claims to have found constantly in the shallow wells and small flowing streams of pellagrous regions numerous larvae of the family Filaridae."[9] Further investigation of the Italian's theory will be welcomed.

The dermatitis, which is the outward and

visible sign of pellagra, is considered by many writers to be a late symptom of the disease appearing only months and years after the onset. It is quite possible that the skin symptoms constitute a late manifestation in many instances, certainly not in all, and it is probable that it is of frequent occurrence early in the disease. A moderate erythema showing on the backs of the hands might be readily overlooked or forgotten by the patient.

It is not at all unusual in my experience for the pellagrous dermatitis to be the only sign of the disease discoverable. One may be somewhat anaemic, perhaps not in the best of health, but there is no gastro-intestinal disturbance, no loss of weight, no failure in strength; accoriding to the patient's story, no insomnia, no nervous disturbances, no exaggerated reflexes; still, the characteristic dermatitis, involving the backs of the hands, extending up the arm to a variable distance, frequently accompanied by the Casal neck band, which Merk[9] regards as absolutely pathognomonic, is found. The eruption may appear annually for years with surprisingly little evidence of constitutional involvement.

Last year I saw an intelligent man, aged 66, who gave a straight history of recurrent attacks of dermatitis limited to the backs of the hands, never extending up the arm, that had appeared each year for fourteen years, beginning in 1897, sometimes showing as early as March, sometimes as late as July, at times accompanied by gastro-intestinal symptoms, frequently not. Last summer, when he presented himself, he showed an absolutely typical dermatitis of the hands and an ill-defined neck band. Though he was in poor flesh, had a bad color and a rather ataxic gait, he has been able to carry on his business all these years and does not consider himself an invalid by any means. He has never had any special nor systematic treatment, and possibly he may owe his present vigorous health to that fact. One unusual feature of this case is that the man has had leucoderma for twenty years, showing patches of varying sizes distributed irregularly over the body, and his pellagrous dermatitis in the summer is sharply limited to a spot nearly covering the back of each hand; that in the winter shows the complete absence of pigment of vitiligo.

It has been customary to offer a most gloomy prognosis in pellagra, but I have become far more optimistic in my views of a patient's chances for recovery than I used to be. Many cases apparently get well, or, at any rate, reach a fair condition of health and go straight through a year with no pellagrous symptoms. We could hardly venture to consider a case rid of the disease until he had gone, say, three years without the dermatitis, without diarrhoea, without nervous derangement. Hardly any case need be regarded as absolutely hopeless. Some there must be who are doomed to a more or less early death from the time the disease is discovered, no matter what the treatment, no matter whom the physician. When, in the course of a pellagrous case, pronounced mental alienation becomes evident, it does not necessarily indicate that the patient is beyond hope or that the mind will never be regained.

I have seen a man aged 64, a chronic pellagrin, become wildly delirious, shouting and raving for two days, quiet down, resume a fairly normal mental state and regain his appetite and strength, and this under the most unfavorable conditions, with no expert treatment, with no trained nursing and with insufficient nourishment.

A guarded prognosis should always be given—rarely ever a hopeless one.

New remedies are brought forward from time to time for the treatment of pellagra. Many of them seem to be good.

It is surprisingly common to read in reports of cases published in the journals of great improvement in the skin lesions of pellagra after a short course of treatment. The writers apparently fail to realize that ordinarily the skin becomes smooth in a few weeks

anyway,[9] if the case be left to itself, and that a dermatitis subsides in a short time is not the slightest indication of skillful management and no evidence that the pellagra is yielding to treatment. Pronounced mental symptoms or an acute mania may show suddenly just as the skin is becoming beautifully smooth and when all seems to be going well.

There is a general tendency to institute vigorous and often heroic measures with a pronounced pellagrin. One loses sight of the fact that he is dealing with an exceedingly chronic affection accompanied by exacerbations and remissions and varying greatly in severity in different cases.

It is well to bear in mind the words of Sir Benjamin Brodie, so rich in wisdom:

"We have no doubt that many well instructed medical practitioners have not sufficiently considered what course a given disease would take if it were left to itself; and as to others it is not possible that they should have any real knowledge on the subject. With the majority of persons a recovery will generally pass for a cure."

The doctor is prone to regard the pellagrin as one who must inevitably die, and in no very long time, unless he begins active treatment straightway and follow it up with energy. It is felt that some remedy is called for that will throttle the disease swiftly and thoroughly, and the remedies brought forth for this purpose have been many. Arsenic is one of the oldest of medicines, and has been vaunted as of special efficacy in a great number of diseases from early times. Very naturally, Fowler's solution was considered a probable cure for pellagra, and its use was revived and urged by Lombroso; large doses were advocated, and for some time, as in duty bound, everyone gave Fowler's solution.

Atoxyl was said to be more continuous and less toxic in its action; this is to be given hypodermically in generous amount and at rather frequent intervals. One fails to do his duty by his patient if he does not use atoxyl. It is discovered after a time that atoxyl is not such an innocent preparation as it was supposed to be; the dangers are mentioned, and, it seems, they are considerable. Atoxyl is dropped. Soamin is heralded as just the remedy needed in pellagra, safer and more efficacious than atoxyl. The up-to-date physician must not fail to give soamin; and, that the disease may not gain a firm foothold, the dosage must be liberal. Numerous surprising cures are effected, we are assured, but it is found that it lacks much of being a specific. Cacocylate of soda someone discovers is the best thing yet; the conscientious physician cannot pass it by.

At last it is found that Salvarsan is the only real specific. Someone finds that the Wasserman reaction is usually positive in pellagra, and though another experimenter equally competent gets a positive reaction but once in thirty consecutive cases, Salvarsan is the long-looked-for panacea, nevertheless; "606" immediately clears up all syphilitic lesions (?). Pellagra is just about the same thing as syphilis, and "it seems probable that it has also a corkscrew-shaped germ;"[10] therefore give Salvarsan, preferably in three doses intravenously, of course, and your patient will shortly be well—quite probably better than he has ever been in his life—and still some of us are skeptical and inclined to the belief that pellagra is little helped by any of these arsenic derivatives. I have used some of them, have seen the others used, yet I have failed to see any surprisingly good results follow their administration; doubtless they may do good in certain cases; no one will deny they are capable of doing harm. Because improvement follows the administration of a certain remedy, it does not follow that the medicament has brought about this improvement. A patient often gets better after the administration of calcium sulphide, chlorine water, castor oil, any one or any combination of the numerous drugs advocated in pellagra, but the physician is usually deceived if he plumes himself on

his skillful therapeutics; the disease is following it usual course, and a remission is in evidence. I had a case last summer—a woman of 50, who has had pellagra probably for several years. She had an almost uncontrollable diarrhoea, which allowed her little rest day or night, and was excessively nervous. She showed the typical pigmented dermatitis of the hands and extending half-way up the forearm, with a band two inches wide on the ulnar side extending to the elbow; in addition, she showed the pathognomic neck band. After a week in bed the diarrhoea suddenly subsided, and she surprised everybody by getting up and saying she was well. The skin lesions cleared up in four weeks, and she has remained apparently well up to this time. All she had was some codein with a bismuth and opium mixture. Had she been treated with "606," how magical the result would have appeared!

The probabilities are that Dr. Harris[11] is as nearly right in his views on the treatment of pellagra as is anyone so far. In brief, the idea is that you should treat the patient rather than the disease; treat him much as you would a case of tuberculosis, with abundant nourishing food, unlimited fresh air, a change of scene and surroundings when possible, rest, and but little medicine.

There is no question that pellagrins are overtreated, over-drugged, and the sooner we realize this fact the better for our patients, the better for ourselves.

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DISCUSSION ON THE SYMPOSIUM ON PELLAGRA

Dr. C. C. Bass, New Orleans, Louisiana: I want to call your attention to the work we have been doing experimentally in connection with pellagra, which promises to throw some light on the disease.

For the last two or three years I have been making blood cultures from possible pellagrous sources, such as, for instance, the stools of pellagra patients, cultures taken from different parts of the intestinal canal at autopsy; bar cornmeal and cornbread. These have all been grown on cornmeal agar for nutrient media, thereby growing only those organisms that can live on corn. The number of cultures runs up to two or three hundred. This summer I selected nine of the most promising cultures for the following experiment: Pure, fresh, immature corn was sterilized and then inoculated with the pure cultures. After several days incubation this spoiled corn was fed to different pens of chickens. After eighty-three days, one of the chickens developed a lesion resembling the clinical appearance of pellagra in man. Lombroso was able to produce in chickens a condition which he believed to be pellagra, and possibly was pellagra, usually feeding cornmeal spoiled by several organisms, or spoiled with a pure culture. The disease was accompanied by diarrhea, emaciation, and finally death of the animal. We have deliberately produced a lesion with a specific pure culture of an organism which we may employ for further experimentation. The proper symptoms of the disease were supposed to be present in the chicken, as, for instance, diarrhea, emaciation, etc., but on the eighty-third day the skin lesions developed on the leg.

I will pass around some of the pictures showing the appearance of the lesions and also pass around a couple of chicken legs showing the lesion. I do not claim for a moment that this may be the only organism that produces pellagra. I do not claim that this organism may not produce pellagra when grown on other culture media.

The organism is visible under the microscope. It is larger than the typhoid bacillus.

Dr. Louis Kohlheim, Saltillo, Mississippi: I rise to say a word or two in regard to the question of early diagnosis of this symptom-complex. I have had experience with eleven cases of pellagra in my practice. The disease is characterized by nervous symptoms, by gastrointestinal disturbance, and by skin lesions. From my limited observation, I am convinced that either one of these three manifestations may be the first to appear.

Dr. J. G. Donald, Hattiesburg, Mississippi: I want to ask a question. Have we reached a point in our knowledge of the symptomatology of this disease

that we can diagnose the disease before the development of the skin lesions? I noticed that in all of these patients an early diagnosis was insisted upon. How early can we make a diagnosis of pellagra, and are we at any time able to make a diagnosis by the condition of the alimentary organs and the nervous symptomatology that go along with the disease? Can we possibly make the diagnosis in advance of the skin lesions?

Dr. J. A. Hayne, Columbia, South Carolina: I cannot let this opportunity pass without expressing my pleasure in having heard the remarks of Dr Bass regarding pellagra. I have made quite an exhaustive study of the disease in the last five months in my state. We have twenty-one hundred cases under observation now, according to reports received from 250 physicians out of 1,200 to whom I addressed a certain postal card with printed questions on it. The questions asked were, "How many patients do you have in your practice? How many whites and how many colored, and how many females and how many males are affected with this disease?" The replies show that there were 2,100 cases under treatment. Of that number there was a large proportion of the female sex; that the disease existed almost all over the state, but principally in the pauper country, or in the manufacturing districts. It occurs also in the mountainous regions of the state.

I have been much interested in the remarks that have been made here by the different gentlemen with reference to pellagra. We have recently had a clinic at the State Hospital Asylum in Columbia; there were papers read on the subject, and the conclusion was reached that we do not know the cause of pellagra; that the cause of this disease can only be discovered by a compilation of an immense amount of facts or data from the practicing physicians all over the country. When we have accumulated a sufficient number of facts, we may then proceed to evolve a theory. The trouble at present is that we have a great many theories and try to make the few facts we have to fit those theories.

It seems to me, Dr. Bass' series of experiments would have been more convincing if he had chosen an animal more nearly resembling man than the rooster. If the hen had been chosen it would have been better, because being of the female sex it might have developed the disease more quickly.

So far as the corn theory is concerned, we have gone so far in our state as to forbid the exportation of corn that shows over thirty per cent. total acidity, and we do not allow that corn to be used. We have a million and a half of people. There are twelve hundred thousand of that number who use cornmeal, and of that number twenty-one hundred have been or are affected with pellagra.

So far as water is concerned, the people live on water courses, and South Carolina has many good water courses.

With regard to the amebic theory, we have an entomologist from the Agricultural Department, Mr. King, who is making an exhaustive study of insects in connection with the prevalence and spread of pellagra. I have seen one case of pellagra in a nursing infant, but I do not know whether the toxins can be carried through the mother's milk to the infant or not. The infant does not eat cornmeal or cornbread. I have seen cases of pellagra that have had nothing to do with corn in any form. As far as I can learn, at present, the cause of the disease is still an open question.

With reference to amebiasis and hookwoorm disease as a cause of pellagra, or being associated with it, we have recently examined the students of certain colleges for hookworm infection, and we found sixty-seven per cent. of them infected with hookworm, and forty or fifty per cent. of them with amebiasis.

Dr. William Krauss, Memphis, Tennessee: With reference to the statistical part of the report read by Dr. Albright, I will say that these figures were taken entirely from checking off the cases as they appeared upon the original reports, and in some respects they may be misleading. For instance, out of 316 cases there is a note of two cases complicating alcoholism, and six cases complicating syphilis. That only means this has been written in that particular report, and it does not mean that those diseases were absent in any of the other 316 cases. I offer this explanation because I think otherwise one in reading the report might be misled.

Dr. William Krauss, Memphis, Tennessee: With reference to nursing infants contracting pellagra, I will say that in my experience in the field I found two cases of infants, one of them being like the case that has been related. A nursing infant I saw at the age of twelve months had contracted the disease at the age of six months, and was getting no nourishment except from a healthy mother. The other showed precisely the opposite state of affairs. The mother of the infant had pellagra, was nursing the infant at the time I saw it, the attending physician having requested her to discontinue the nourishment, and although the mother had for five weeks suffered from the virulent form of pellagra, and during four of these five weeks had nursed the infant, the infant was in perfect health, so that with respect to the transmission of any poison through the mother's milk, we have no proof in either direction.

PAPER OF DR. JELKS.

Dr. Charles W. Stiles, of Washington, D. C.: In any locality, where we find a common infection with intestinal parasites, I think we ought to be doubly cautious about drawing general conclusions as to the connection of those parasites with any particular condition.

In the last two years the reports in regard to the frequency of amebiasis in the South have been distinctly disquieting. We have reports from various parts of the South stating that ten, twenty, thirty, forty, and perhaps even a higher percentage of our people are affected with the amebae. There has been a disposition to discredit the exactness of the statistics. It seems to me that the real point at issue is this, namely, what particular forms of amebiasis do we have here? There are ten or twelve different species of amebae reported as parasitic in the human being. Now, when we report that amebiasis is very prevalent in a given district, it does not mean anything special to us unless there accompanies such a report a definite statement as to which particular kind of amebiasis is present. It is not strange that several investigators of pellagra have recently associated amebiasis with it. It might be strange if some one had not done so in the part of country where amebiasis is so exceedingly prevalent. It so happens, by a

pure matter of chance, possibly, that I have recently examined a large number of southerners for infection with amebae, and I find that the statistics of infection have not been exaggerated. In fact, they may perhaps be below the actual percentage; but the important point is this, that the common amebiasis which we have in our Southern States is the non-pathogenic form. The common amebiasis, at least in the locality where I have been investigating this subject—is brought about by entamoeba coli, and as is known, infection experiments both on animals and on man have shown that this species is non-pathogenic; entamœba histolytica, the pathogenic form, has been relatively rare in my examinations. Entamœba tetragena, the other established pathogenic form, I have not yet found in the southern states. It may be present, but it so happens that I have not found it.

There are other amebæ that I have found, but I am not prepared to state exactly what they are.

I must say, that I admire very greatly the enthusiasm with which our friend from Memphis has followed the subject of amebic infection. I agree with him thoroughly from a statistical point of view, but at present I am not quite able to agree with him in regard to his general conclusion, because, from the experience I have had thus far, I am not able to say that the mass of amebic infections in the South has any particular medical significance. Where we find amebic infection which can be transmitted both to animals and man experimentally without bringing about any symptoms, we will do well to be very conservative before accepting that species as having anything to do with pellagra. Although Dr. Jelks and Dr. Long, who are the exponents of the amebic side of pellagra, have undoubtedly found what they claimed to have found, neither of them has as yet stated to us which species of ameba they were dealing with. We have many different species of protozoa in our intestines, some of which are pathogenic, and some are not, and the simple finding of amebae I cannot accept at present as having any etiological relation with pellagra.

ON PAPER OF DR. JELKS.

Dr. Chas. F. Craig, U. S. Army, Washington, D. C. I was much interested in Dr. Jelk's paper, but like Dr. Stiles, I would like to know the species of ameba he found in these cases.

As far back as 1905 I published researches on the examination of the fæces of men in the U. S. Army Hospital at San Francisco. I examined the stools of over one hundred healthy men, and found that sixty per cent. of them showed *entamoeba coli*, the non-pathogenic species, in their fæces. These men came from all parts of the United States. Merely finding amebae in the stool does not mean anything. We ought to determine what species we are dealing with; whether we are dealing with the non-pathogenic or pathogenic species.

As regards the occurrence of pellagra in connection with amebic dysentery: At the Presidio of San Francisco we had over two thousand patients admitted to hospital suffering from amebic dysentery. There was never any evidence in any of these cases of the skin lesions so characteristic of pellagra, the only symptoms being those common to amebic dysentery. Certainly there were no cases of pellagra among these men. I autopsied over three hundred men who died of amebic dysentery, and none of them showed any lesions of pellagra. These men were infested with the pathogenic species of ameba, and from this experience I cannot believe that amebiasis has anything whatever to do with pellagra, any more than that perhaps it may rarely offer a portal of entry through the intestine to the etiological factor concerned in the latter disease.

I certainly hope that Dr. Bass has isolated the cause of pellagra. His experiments are very interesting, and the lesion present in the chicken is remarkable.

I would like to ask him if he produced the disease with the organism isolated from the infected chicken?

Dr. Bass. Yes, sir.

DISCUSSION ON THE PAPER OF DR. KOHLHEIM.

Dr. Charles F. Craig, U. S. Army, Washington, D. C.: I want to congratulate Dr. Kohlheim upon his paper because it shows that the use of the microscope is spreading among country practitioners. I can remember the time when the medical profession scoffed at the laboratory man when he told the general practitioner about the use and value of the microscope. Now the microscope is being used more frequently all over the country than ever in the past and if a doctor practising in a country district has time to use the microscope, then any practitioner should be able to use it.

I congratulate the profession on the fact that there is a great advance being made in the scientific diagnosis of intestinal conditions. I also want to agree with the doctor in what he stated regarding the diagnosis of these conditions from the inspection of the patient. You cannot diagnose the species of worm present by looking at a person, because all worm infections produce, in a greater or lesser degree, similar effects, and it is impossible for any man to make a diagnosis of ascaris, strongyloides, or hookworm by looking at a patient, without a careful examination of the stool with a microscope, except in very severe hookworm infections, and even then the diagnosis must be largely guess-work. Every case of vermic infection should be diagnosed by microscopic examination of the fæces.

I was sorry Dr. Kohlheim did not give us a little more information in regard to the number of cases of amebic dysentery found in his region, because that is an important point in his investigation. The finding of amebæ in the stools does not mean anything unless we know what species we are dealing with, as has been pointed out by Dr. Stiles. From thirty to fifty per cent of the people of the South have harmless amebæ in their intestine.

I would like to ask Dr. Kohlheim to give us some information regarding the number of patients infected with pathogenic amebæ in his locality.

Dr. J. S. Turbeville, Century, Florida: I saw a case three years before any of the symptoms could be interpreted as pellagra, were present. Then the patient had an eruption on the hands, face, neck, and on the body. This woman complained a great deal. I found indican in the urine, and kept her under observation for some time. I do not recall now whether she had nervous symptoms or not. She was neurotic. I am of the opinion that her

nervous symptoms antedated those symptoms upon which we make our diagnosis, and those are usually the skin lesions. I believe the nervous symptoms in a number of cases antedate diarrhea. I have not made any blood examination of any consequence except to eliminate malaria. I have found cases of pellagra complicated by hookworm, or complicated with tubal disease in women. It has been my impression that where we have nervous symptoms they antedate the gastrointestinal symptoms. I have found further in the early cases a thickening of the viscera of the abdomen. I wish the gentlemen would look out for this when they return home. You can feel folds in the matima in a great number of cases where the diarrhea has not existed long, so that the infiltration is from some intestinal lesion. I believe the diarrhea, the mouth symptoms, and skin symptoms are secondary to some disturbance in the central nervous system, producing hyperesthesia, and exfoliation of the epithelium and consequently a vulnerability of this structure throughout the body. Most of the women have a vaginitis; some of the men have a purulent urethritis, and I have never yet failed to examine for ulcer of the rectum and find it. I believe the mouth symptoms are due to exfoliation of the epithelium, and infection after that is easy.

In regard to pellagra in young children, I have seen one case which was interesting to me. It was pellagra in a cretin. We treated the child for cretinism, from which it improved; but the pellagra symptoms the child had did not improve. The skin symptoms were the same after as before treatment. It was one of the prettiest cases of pellagra I have ever seen.

I have a pellagrin who is nursing a healthy baby. The patient was sent to me the other day, she having been treated by another physician for pellagra. The baby was perfectly well, and I advised her to go on nursing the baby, in order that the child might be watched. I do not know whether the child will contract pellagra or not, but I was very much interested in what Dr. Krauss had to say in the cases he spoke about.

Dr. H. M. Folkes, Biloxi, Mississippi: I think all of us are interested in the scientific part of this work, but from the standpoint of the plain country doctor, I am also interested in looking at some of the practical parts of it.

I have had fifteen cases of pellagra, four of them having died. One of them died within twenty-four hours after entering the hospital, and another within forty-eight hours. In a case in which death occurred four days ago, the disease had existed for five years.

As to the etiology of the disease, which is a very practical part of it, it seems to me, we should bear in mind that the preponderance of evidence to date points to the theory of corn, and that we should take action accordingly, that is, from the standpoint of benefiting these patients.

Of the other eleven patients I have treated, all have practically recovered from the disease. This brings up the question of prognosis. I think Dr. Bass is perfectly right in emphasizing the fact that pellagra is not necessarily so fatal a disease as we have been led to believe. I think, too, we have been having pellagra in this country for many years. As I look back, I am quite certain now that twelve years ago I had a patient who had pellagra, and so far as I know she has not had a secondary attack. I had a case five years ago. I did not then know what was the matter with the patient, but I thought she had amebic dysentery, as the stools conained amebæ. I am confident now she had pellagra. She had a typical bilateral symmetrical erythema. She had stomatitis; she had profuse diarrhea; she had a large amount of albumin in the urine, and was seven months pregnant. She is well today.

The question of treating patients with pellagra has been touched on by Dr. Leroy, who says that we should not give much medicine. I have confined myself almost solely to quinine, six grains a day; the thirtieth of a grain of strychnia, three times a day; three minims of Fowler's solution of arsenic, three times a day; five minims of tincture muriate of iron, three times a day, and in addition to that have given these patients milk and eggs and buttermilk. One of my patients was a woman who lived in good circumstances. She had what we would term the classical picture of the disease. She had an acute mania which lasted for fourteen days. At one period in the disease the pulse was 150; the hemoglobin index 65; there was no albumin in the urine; no fever at any time; she had a most profuse diarrhea, having sixteen or eighteen passages a day. She had vaginitis as well as stomatitis. I did not give her bismuth, but pushed the milk and eggs, quinine and arsenic and strychnia mixture, and in fourteen days she was walking around and today is well apparently.

There is a curious thing to me about the condition of the skin. Following the marked erythema, which has been referred to, after that clears up the skin is unusually smooth and thin. I am quite positive from my own experience with patients in the Soldiers' Home in this state, where we have had as many as four or five hundred admissions in the last eight years, that there were quite a number of cases among these old people who showed this curious thinning of the skin. Of course, I am aware of the fact that there are many skin changes occurring in old people, so possibly that may account for it.

(Later. Since the foregoing remarks were made this last patient has taken suddenly ill with a recrudescence of all bad symptoms, and died in less than a month.)

Dr. J. T. Searcy, Tuscaloosa, Alabama: I did not expect to say anything upon this subject. I came here to listen and learn. I will say, however, that in my opinion the etiology of pellagra is still an open question, and its treatment still relates principally to the symptoms.

In the fall of the year 1906, in the Mount Vernon Hospital for insane negroes, near Mobile, we recognized pellagra. A few weeks before that the trustees met at that place and demanded of me, that some investigation be made of a most serious disease we had prevailing. On returning to Tuscaloosa the question worried me a great deal. My son, Dr. George H. Searcy, who had been reading on the subject, said he believed that the disease was pellagra. We immediately instituted an investigation. He had previously been some four years an assistant physician in charge at Mount Vernon, and was acquainted with the symptoms. He again visited the

Hospital and went to New Orleans, studying literature on the subject. In the spring of 1907, he read a paper before the Medical Association of the State of Alabama, on the epidemic of pellagra at Mount Vernon. The article was published in the *Journal of the American Medical Association,* and if I remember correctly, was the first published notice of the prevalence of pellagra as an epidemic in America. We have since that time seen a great deal of this disease in both our institutions.

One peculiarity about pellagra is that its toxins affect the psychic center more than those of any other disease. You get psychopathic symptoms in pellagra more than you do in malaria, hookworm disease, tuberculosis, typhoid fever or any other autotoxic disease; consequently the pellagrins drift into the insane hospitals. They come in nowadays from all directions. From the statistics we have been able to accumulate at our hospitals in the last two years, with an admission in that time of over fifteen hundred insane patients, we find that the disease is extending over the whole state of Alabama. It is spreading principally in the back country, and rapidly extending among the whites, but a few of the cases come in from the towns. It is a back country disease more than a town disease, and in the majority of cases, we can get a history of a summer recurrence of the symptoms for a number of years. In my opinion, the primary lesion is in the digestive tube and the skin lesions and the psychic symptoms are secondary occurrences in the course of the disease.

In our two hospitals we have on an average three hundred employes, and in going back for ten years I do not recall any employe ever having contracted the disease. I have often stated that fact as a matter of assurance to some people who are afraid they will contract pellagra from another person.

Dr. H. E. Menage, New Orleans, Louisiana: I was particularly interested in the remarks made by Dr. Stiles on the amebic feature of the disease. I had the good fortune to serve in the Philippine Islands for a year and a half, during which time I saw a great deal of amebic infection, and looking back I do not remember seeing anything in the way of a skin disease that looked like pellagra there, and although I have no statistics, I am particularly impressed now, after looking backward, with the absolute absence of anything that looked like pellagra.

The treatment has been gone over, but no mention of quinin has been made as a therapeutic agent. We are indebted to Dr. Dyer for the suggestion of the use of quinin in cases of pellagra. Dr. Dyer has had several cases which have been clinically cured with quinin. In addition to the administration of quinin attention has been given to the diet of the patient, general hygiene, etc. But I wish to give credit here to Dr. Dyer for the successful treatment objectively and clinically of some cases of pellagra with quinin hydrobromate.

tion of corn that shows over thirty per cent. total acidity, and we do not allow that corn to be used. We have a million and a half of people. There are twelve hundred thousand of that number who use cornmeal, and of that number twenty-one hundred have been or are affected with pellagra.

So far as water is concerned, the people live on water courses, and South Carolina has many good water courses.

With regard to the amebic theory, we have an entomologist from the Agricultural Department, Mr. King, who is making an exhaustive study of insects in connection with the prevalence and spread of pellagra. I have seen one case of pellagra in a nursing infant, but I do not know whether the toxin can be carried through the mother's milk to the infant or not. The infant does not eat cornmeal or cornbread. I have seen cases of pellagra that have had nothing to do with corn in any form. As far as I can learn, at present, the cause of the disease is still an open question.

With reference to amebiasis and hookworm disease as a cause of pellagra, or being associated with it, we have recently examined the students of certain colleges for hookworm infection, and we found sixty-seven per cent. of them infected with hookworm, and forty or fifty per cent. of them with amebiasis.

which we recognize, are referable to three systems—the gastrointestinal, the nervous, and the skin or cutaneous system. The gastrointestinal symptoms are not unlike the gastrointestinal symptoms in many other diseases and many other conditions, and we are unable I believe to differentiate the gastrointestinal symptoms of pellagra in man from those of other diseases in man, and if we had to depend upon the gastrointestinal symptoms for recognition and identification of the disease, we would not be able to determine whether the experimental animal had pellagra or not. When it comes to the nervous symptoms, the emaciation that follows, and other symptoms which are likely to follow from starvation and the feeding of incomplete diets of any sort, they are so indefinite either in man or especially in animals that we are unable to recognize them with certainty.

As for the skin symptoms, I have been unable to get an experimental animal that presents skin exposed or uncovered by hair, or feathers, or something of that sort. Chickens have bare legs. The skin lesions of pellagra, as we all know, do not develop, as a rule, or they practically cannot develop except on skin which is exposed or which is not protected. Therefore, in order to get the skin symptoms by which we could identify the disease, I believe, we must use an animal that has some bare skin.

As to the diagnosis of mild cases of pellagra, I should say that from what I have been able to learn of the disease, I am absolutely certain that I cannot diagnose a large per cent. of the mild cases of pellagra I see. If I should happen to see the cases at the time they have the characteristic skin lesion, I might then make a diagnosis of extremely mild cases. The skin lesions of a very mild case of pellagra last only three or four or five or six days If we see them before or just after, we can make a positive diagnosis of pellagra.

As to my opinion of treatment and the reasons for it; if corn is the cause of the disease, or if it is probably the cause of it, and we must all admit it is possibly the cause of it, then the first step in the treatment of cases of pellagra is to withdraw corn food forever. It has been demonstrated repeatedly that pellagra patients, who have recov-

cred or improved, if fed on spoiled corn will promptly develop the nervous and intestinal symptoms if not skin lesions. A patient may tell you that he never ate corn in his life, but it is an absolute fact that a great deal of the wheat flour or common flour on the market up to the enactment and enforcement of the pure food law contained as much as two-fifths of its quantity of corn. Usually a man who is sufficiently unscrupulous to adulterate food is not likely to be very choice as to the quality of the adulterant. I hope Dr. Albright will tell us what he knows along that line.

The next step in the treatment is that the patient should be warned, as long as he is susceptible to the production of the skin lesion by exposure to sunshine to avoid it religiously. Almost always coincidentally with the development of the lesions or soon following them there is an intensification of the nervous symptoms and gastrointestinal symptoms. A patient is hurt by the development of skin lesions, and I make the point that as long as a patient can develop the skin lesion he should avoid sunshine by umbrella, a wide brim hat, and so forth.

Let me refer to a third step in the treatment of pellagra. We know from our observations that whenever cold weather comes, or the first cold spell, pellagra patients get well as a rule and remain so until the next spring, when warm or hot weather comes again. That is the most natural and most certain cure and remedy we have observed for pellagra. There are patients with pellagra who are so sick from the disease that they will be unable to live the summer through in a hot climate, but such patients may be frequently saved by sending them to a cold climate. I believe I was the first to recommend this in a note published in the *Journal of the American Medical Association* about a year and a half ago.

Regarding the use of medicine, my personal conclusion, after trying a good many of the remedies and observing a good many cases that have been treated with other remedies, is that I do not know of any medicine which has a particle of direct influence on the course of pellagra. I think those of you who have seen many cases of the disease in consultation will recall patients who gave you a history that they had the lesions develop on the hands; that they had consulted a doctor; the doctor prescribed ichthyol ointment or carbolic ointment, or this or that application, but almost always with harmful results. The skin lesions have continued to spread. I have seen them spread from the wrist to the elbow. I do not believe any strong local application is harmless. Possibly there are some applications that are harmless. I have covered the hands with gloves regardless of how sick the patient might be, and I believe it is the best thing to do.

With regard to the administration of medicine internally, I will say that like sunshine, which is a source of irritation to the skin, chemical irritations of various sorts may be and will be a source of irritation to the gastrointestinal canal, and all such drugs as iodid of potassium, ichthyol, and many other drugs we might mention, are likely to be harmful and extremely unlikely to be beneficial.

PRACTICAL TREATMENT.

By Many Writers. Edited by John H. Musser, M.D., LL.D., and A. O. J. Kelly, A.M., M.D. Volume III. Octavo, 1095 pages, illustrated. Philadelphia and London: W B. Saunders Company, 1912. Cloth, $6.00 net. Half Morocco, $7.50 net.

The third volume of this monumental work is now ready for the use of the medical profession. If the reviewer were simply to state that this volume is worthy of its predecessors in every respect it would be high and well merited praise and endorsement of its great value, but the book is entitled to a more detailed consideration than that. The wide range of authorities consulted, the reputation for scientific attainments enjoyed by the thirty-eight writers who have contributed to this volume and the general interest now felt by the profession in the subjects to which this volume is devoted, warrant the prediction that a wide and long continued demand for it will soon be manifested

Constitutional diseases come first, including diabetes, obesity, inanition, scurvy, arthritis deformans gout, rheumatism, etc. Diseases of the respiratory sysem are next considered, then diseases of the digestive system, the urinary system, the nervous system, muscles, and diseases of the mind.

Janeway is the author on diabetes mellitus, and his views are clearly and forcibly expressed, as would be expected by all who know his "style." He declares that no physician should be satisfied with the condition of a diabetic if he has "even a fraction of 1 per cent of sugar in the urine." His treatment is, of course, dietetic. He does not consider diabetes in pregnant women a justification for emptying the uterus, but urges energetic treatment instead. He warns against mistaking a lactosuria for a true diabetes in such conditions. He believes in a hereditary tendency to the disease.

Dr. Thomas B. Futcher, of the Johns Hopkins, treats of that bewildering condition called arthritis deformans. He classifies its varieties as "Chronic Villous Arthritis, or Dry Joint," "Atrophic Arthritis, including Still's Disease," and "Hypertrophic Arthritis." He urges early diagnosis, careful and sympathetic nursing, rest, diet, and local treatment. He speaks doubtingly of Bier's treatment. After the hot air treatment he uses massage. He considers the salicylates, including aspirin, the most useful drugs. Not all physicians will agree with him here, for some assert they have never seen a case benefited by them for more than a brief period, while their effect upon the upper digestive tract is, they say, very pernicious.

The foregoing should give a general idea of the character and usefulness of this splendid work in every department of internal medicine.

As suggested in the first line of this review, the work is ***monumental.***

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Next Meeting Jacksonville, Fla., November 12, 13, 14, 1912.

Pellagra

The editors of this *Journal* call attention to the exhaustive survey of the above subject presented in the present number. The articles are written by men "on the firing line," to use a modern and expressive phrase. They have for months or years wrestled with this obstinate, serious, protean disease; have observed its varying phenomena which seem to control so many of the vital functions, ranging from a skin eruption, an indigestion, a diarrhoea, or a salivation, to hopeless insanity, gradual degeneration and death. They have investigated every suspected cause of the disease, tried every known form of treatment, recorded their observations and results, and now lay the whole matter before the medical profession through the medium of the *Southern Medical Journal.*

It is doubtful whether any more comprehensive and authoritative digest of this subject has, during recent years, been submitted to the consideration of English-speaking physicians. No single author can record in a book based upon his own personal observations an account of pellagra equal in value to the sum of observations and conclusions formed from the work of these active practitioners and the coworkers assembled to discuss it from the point of view of actual experience. We advise our readers to carefully preserve this number of the *Journal.* The edition will doubtless be soon exhausted, and duplicates will be hard to find.

The Graft of Fee-Splitting

Times change and we change with them, said the heathen philosopher, and his epigram applies to the practitioners of medicine and surgery in many ways.

Among those changes stands out in bold relief their increased knowledge of the human

machine and its needs in health and disease. But their advance from the barber-surgeon, who bled his patients as they sat in his shaving chair, to the modern specialist with his immaculate operating rooms and spotless infirmary, is no greater than the change in the point of view from which the modern doctor regards the financial side of his profession.

We are passing through a period when the business relation between doctor and patient are undergoing an inevitable readjustment. Precisely what the ultimate result will be no man can tell. Perhaps it is safe to assume that some understanding satisfactory to all will finally be reached; one that will give the general practitioner the reward to which his ability entitles him, the eminent specialist an adequate fee, and will so adjust the financial burden that all sufferers shall receive the attention their condition requires at a cost proportioned to their ability to pay, the same being regulated by some sort of "sliding scale" known and approved by the public. At present our financial relations to our patients are often illogical and unfair. The general practitioner may render faithful and adequate service for many months preparing his patient to undergo an operation at the hands of some specialist. When the great man has done his work the grateful patient cheerfully pays him an amount of money which he would indignantly refuse to pay to his regular doctor for half a lifetime of skillful, faithful service.

No one can deny that this condition of affairs is inequitable and needs correction in some way, but no wrong can be remedied by substituting another and greater wrong. Any plan which utilizes the confidence a patient reposes in his doctor to secure that patient's money without his knowledge, money which he would refuse to pay to that doctor if asked for it, is essentially dishonest and therefore dishonorable.

Any scheme that tempts a doctor to sell his patient's operative chances for recovery to some surgeon or specialist who offers him a commission or part of his fee, is essentially dishonest and therefore dishonorable.

Any agreement between a doctor and a sanatorium that he shall receive a commission on every patient he places in its wards is essentially dishonest and therefore dishonorable.

Right here let us say that not every physician who has done either one of these things is necessarily a dishonorable man. Without doubt many a good, honest doctor has accepted some such sort of a bribe without realizing that he was committing a crime against his patient, himself and his profession. He did not recognize it as a bribe, as pure and simple graft. Such men, when once their attention is directed to the truth of the matter, will blush and sin no more.

One such unconscious lapse from honesty should not be counted against them.

It is not only doctors who are sometimes bewildered where the paths of right and wrong have not been plainly marked. Quite recently a medical journal, one that poses as a mentor for the profession and all that pertains thereto, used expressions in a long and brilliant editorial that, if they did not condone the offense under discussion, certainly seemed to do so. It seemed to think necessity some excuse, though it did not exactly say so. We all know that no judge or jury would forgive a robbery because the culprit "needed the money."

Fee-splitting is a subject of vital import to the profession at large. It behooves us to see to it, through our periodicals, our associations, our outspoken opinions and our individual actions, that the rot of this degrading practice be not allowed to infect our ethics and dishonor our calling. We must insist that more than money doctors need the confidence of their patients. They need the confidence that has in the past placed the lives, the fortunes and the reputations of trusting families as unreservedly in his hands as into those of God himself.

To a great degree that splendid confidence

is still ours, and also to a great degree we are still worthy of it. It is up to us to see that weaker brethren unconscious of the destruction they invite shall not further weaken the hard won faith that the public still reposes in the honor of the doctor.

We must fight this fungus excrescence that is threatening to tear from us our professional self respect. We must strangle this infant infamy before it crushes us. We must expose in its true, shameful colors what is meant by the secret sale of a sacred trust, whereby patients are unconsciously fleeced of their money by this new confidence game. It is only here and there that there is such a transgressor. Now is the time to end it. If we find that a specialist anywhere, however eminent, is offering bribes under any disguise, we must ostracise him. If we learn that one of our brethren has yielded to temptation, we should forgive him, but we most not fail to labor with him.

We can and we must make bribery and grafting such as this infamous in the sight of our profession.

The Owen Bill

In a recent address before the New Orleans Forum, Dr. Isadore Dyer, dean of the Medical Department of Tulane University of Louisiana, forcibly advocated the passage of the so-called "Owen bill," now under consideration by the Senate of the United States.

He showed that the popular notion that the bill is intended to support any one school of medical practice against any other school is entirely erroneous; that there are no politics in it, no private or professional axes to grind; that the outcry against it is made by an organization of wealthy manufacturers of unethical medical preparations, who object to being forced to reveal to a suffering public the actual inefficiency of their much advertised nostrums; that the Owen bill contemplates an organized campaign against preventable disease, directing its operations against the impurities in drugs and food, and the diseases already grafted upon our people. He says: "What has the League for Medical Freedom done? Are the patent medicine vendors disturbed lest their reckoning come too soon?"

In reality the technically patented medicines are few, but those protected by trade names are legion, and their makers fear that if the Owen bill becomes a law they will be forced to tell the truth about all their concoctions, and will find false statements about their therapeutic effects no longer allowed.

Great is the power of a lie. The bigger the lie the more effectual. The medical freedom shriekers know perfectly well that the constitution of the United States guarantees every man the right to do with himself and his property as he pleases, but not to deceive his neighbor for the sake of gain. That's what's the matter. The unethical proprietary medicine manufacturers and the advertising quack fraternity object to being forced to tell the truth. The adulterated food men want to be left alone. The anti-vaccinationists wish to be allowed to risk having smallpox themselves, or for their children, no matter who else dies of it. The religious fanatics want to let their children die of diphtheria without being prosecuted for neglect. The anarchist demands the right to distribute his cholera or plague poisons at will unhindered by law. All these are ardent supporters of the League. But what have they ever done for any one but themselves? It is a disgrace to human intelligence that such a cult should find educated supporters. Freedom! Freedom! Who wants to meddle with their freedom?

So far as the Owen bill goes they may worship multiple widows, or even gateposts, starve or burn themselves, but not impose on the helpless or ignorant, and cause them to suffer; or what is still more common, rob them of their money by false pretenses. Their plan is an old one. Set up fictitious wrongs and then claim the sympathy of their fellow citizens for wrongs that do not exist even in their own imaginations.

Dr. Dyer expresses the sentiment of every thinking and right minded physician, and we are glad to see that the public is becoming informed on the subject. The independent newspapers, i.e., those that have a conscience and judgment enough to discriminate as to fraudulent or deceptive advertising, have taken up the fight against this unholy alliance of greed, quackery and fanaticism.

We are pleased to announce that Mobile has such a newspaper in the Register, whose able and fearless president and principal owner, Mr. F. I. Thompson, recently refused an advertising contract amounting to six hundred dollars offered by this so-called League of Medical Freedom, because he construed it as an attack upon the organized medical profession. It is refreshing to see a newspaper that prefers "decency to dollars."

Dr. Dyer's paper should be published in the daily papers, so that the public may know the truth about the Owen bill and the fallacy of the infamous teachings of its opponents.

Oklahoma and the Southern Medical Association

Under the head of "Correspondence" we publish in this number a letter from Dr. Ira W. Robertson, of Dustin, Okla., urging the right of the physicians of that energetic young state to be admitted into the Southern Medical Association. Of course the editor speaks only for himself in such matters, having no authority therein, but he believes he voices the sentiments of the entire association when he declares that Oklahoma doctors will not only be welcomed, but *claimed* by the Southern Medical Association as blood-born brothers. Its president will not criticise their constitution and hold them off until they have changed to suit him. The only requirements will be membership and good standing in some regularly organized Oklahoma medical society, a request from such a representative duly authorized that Oklahoma be admitted to membership, and the association at its next meeting will throw wide open their doors with, "Walk right in and make yourselves at home, for that's where you are." No organization of southern doctors can feel like strangers on our floor.

Deplorable Accident

The many friends of Dr. J. F. McKinstry, Jr., of Gainsville, Fla., will regret to learn of the serious accident which has recently befallen him. He had stepped to his auto to place therein a hammerless shotgun loaded with birdshot. An unnoticed obstacle in his pathway caused him to stumble in such a way that the gun was thrown violently onto the floor of his auto and was discharged, the entire load finding lodgment in the doctor's left ankle and ranging downward into the foot, shattering the leaders and bones to a frightful extent. Examination showed that the foot was so badly mutilated that amputation would be necessary, and Dr. M. H. DePass, assisted by Doctors J. H. Colson, J. M. Dell, E. Lartigue and W. Lassiter removed the injured member, amputation being made about four inches above the ankle joint. Dr. J. F. McKinstry, Sr., was also present. Just prior to the operation Dr. McKinstry, at his own request, was united in marriage to Miss Nellie F. Swan, William R. McKinstry, Notary Public, officiating.

The marriage was to have occurred on the following Monday, but the unfortunate accident hastened its culmination, and the bride, though grief-stricken at her husband's misfortune, will assist in nursing him to health. It is to be hoped that he will soon recover.

Mississippi State Board of Health

This energetic board is doing good work under the leadership of Dr. W. S. Leathers, Director of Public Health and Hygiene. There seems to be an awakening of the profession all over the State. The county medical societies generally are active, and in two instances have organized regular associations with other

societies, namely, the East Mississippi Four County Medical Society, which met last at Amory, and the Tri-County Medical Society, which met at Brookhaven. It is not out of place here to remark that the Mississippi members of the Southern Medical Association are among the most active and influential in the organization. One important effort recently undertaken by the physicians of Mississippi is to get the legislature, in session at the time of this writing, to pass a law that all applicants for license to practice medicine shall possess a diploma from some reputable medical college.

The Mississippi Medical Monthly, in its number for February, states that "as we go to press the bill has unanimously passed the senate." That is certainly a good start, and it is to be hoped the bill has become a law, and will be enforced.

The members of the Mississippi State Board of Health are appointed by the governor, thus leaving open a door for the entrance of politics into the organization. In this instance, however, all but two of the appointees are members of the state association. The association has sections corresponding with the different departments of medical study—Medicine, Obstetrics, Materia Medica, Surgery, etc., like a regular medical college, with an able chairman for each section.

This certainly *"looks like business."*

Dr. H. T. Inge, Chief Surgeon of the Mobile & Ohio Railway

The unsolicited appointment of Dr. Inge as Chief Surgeon of the Mobile & Ohio Railway, to succeed the late Dr. Rhett Goode, is a deserved compliment to one of the South's leading surgeons.

Mobile has a number of surgeons who rank with the best and that General Manager Taylor and President Findlay of the Mobile & Ohio Railway should have selected Dr. Inge for the very important and responsible position of Chief Surgeon of that great railway system is a splendid tribute to his ability.

Dr. Inge is not only prominent as a surgeon, but is actively identified with the leading medical organizations of the country. Among the honors that have been conferred upon him by his professional brethren—and one of the greatest that can be given to a southern surgeon—is his recent election as Chairman of the Section on Surgery in the Southern Medical Association.

The surgeons of the Mobile & Ohio Railway are most fortunate in having for their chief a man so lovable and approachable as Dr. Inge, and the officials of that railway are to be congratulated upon the selection of a man of such prominence and a surgeon of such reputation.

Dr. E. D. Bondurant

The recent appointment by Dr. George B. Denny, President of the University of Alabama, of Dr. E. D. Bondurant as Dean of its School of Medicine, is entirely satisfactory to all true friends of higher medical education whether they be connected with the university in any way or simply in sympathy with all educational advances. Dr. Bondurant is well known and greatly admired throughout the country as an authority in mental and nervous diseases, having a large experience as physician in the Alabama Bryce Hospital for the insane. He came from there to Mobile to assume the duties of a professor of pathology and nervous diseases in the medical college. He has from the beginning been an advocate of every advance in medical teaching in harmony with modern methods and ideals.

He possesses the unanimous confidence and support of the students and instructors in the college and of all his fellow citizens who know him.

He is a man of broad education and high ideals, in the prime of life and full of enthusiasm and belief in his work.

It is a fortunate appointment, and an evidence of the practical good sense of Dr. Denny, who appointed him.

BOOK REVIEWS

DISEASES OF CHILDREN FOR NURSES.

Including Infant Feeding, Therapeutic Measures Employed in Childhood, Treatment for Emergencies, Prophylaxis, Hygiene and Nursing. By Robert S. McCombs, M.D. Assistant Physician to the Dispensary and Instructor of Nurses at the Children's Hospital of Philadelphia. Second edition revised. Octavo of 470 pages, illustrated. Philadelphia and London: W. B. Saunders Company; 1911. Cloth, $2 net.

This little book of less than 500 pages is one that makes the reader "set up and take notice." It presents so many facts, self-evident but seldom realized, that are important and interesting to those who are in any way connected with the care and rearing of children that one cannot "merely glance through it," as is too much the modern habit, but has to read page after page to satisfy the curiosity aroused, or the desire for further information. For instance, speaking of the "cries" of infants, the author enumerates the following conditions as having each a cry more or less distinctive: Hunger, indigestion, pain, weakness, temper, habit, to which one might add the cry of terror; cries distinctive of hydrocephalus, meningitis, marasmus, hereditary-syphilis, and pneumonia, are also mentioned.

Several of these sounds are described, together with attitudes of hand, limb or body that accompany them. All this is on one page. On the next the causes of the sudden deaths of children are stated, together with the ages at which those causes most frequently prevail. And so on, from page to page, from picture to picture (and they are very numerous), clear through the book new gems of observation, thought, knowledge and instruction flash into view. For the pediatrist, the professional nurse, and the intelligent mother, the whole book is a casket of helpful gems, worth ten times its price.

DISEASES OF THE STOMACH AND UPPER ALIMENTARY TRACT.

By Anthony Bassler, M. D. F. A. Davis Company, Philadelphia.

Aside from the excellence of the text and the soundness of its teaching, this book is remarkable for the number, variety and perfection of the illustrations. Photographs, photomicrographs, lithographs and colored photo-electrotypes abound, and schematic drawings or diagrams appear wherever they can elucidate the text. In his preface the author reiterates the accepted doctrine that the doctor who aspires to become a specialist in gastro-enterology should enter upon the duties of that specialty only through the gates of years of experience in internal medication or general practice.

The practical part of the work really begins at chapter IV, wherein he describes his system of investigating the condition of a patient with the question, "In what way do you seem to be ill?" He urges the systematic preservation of complete records of all cases. He gives a list of interrogatories he has found efficient in extracting desirable information. Further along the reviewer is impressed with the great usefulness of certain roentgenographs and diagrams compiled from them showing vividly various degrees of gastroptosis.

Still further one is forced by one's interest to pause over photomicrographs showing the ova of various parasites found in feces. In chronic gastritis he uses bismuth freely, generally the subnitrate, but prefers the subcarbonate where there is much acidity. If constipation is present he gives magnesia usta with the bismuth, as follows: Magnesia usta, 21-2 drachms; bismuth subnitrate, 5 drachms; distilled water, 6 ounces. Dose: A tablespoonful half hour before meals. In acid cases he subsitutes the subcarbonate for the subnitrate, and combines it with mistura ahei et sodae instead of water. In fact every one of its 800 pages is of solid value.

DISEASES OF THE DIGESTIVE CANAL.

By Dr. Paul Conheim. Specialist in Diseases of the Stomach and Intestines, Berlin. From the second German edition. Edited and translated by Dudley Fulton, M.D. Illustrated; 375 pages. Price $4 net. Philadelphia and London: J. B. Lippincott Co.

The popularity which the work of Dr. Conheim has already achieved will be increased by the present edition. It has two very strong points that recommend it to American practitioners, namely: it is intensely practical, and emphasizes the value of clinical study. Its illustrations are new and characteristic, each being introduced just where it is needed. Formulas for treatment, dietary, physical and medical, abound in its pages, and the clinical records of numerous cases are presented to illustrate particular points of diagnosis or treatment.

It is a book to which the busy practitioner can turn for prompt counsel and be not disappointed. He seldom recommends a starvation diet. The dietary prescribed, on page 151, for cancer of the stomach, though delicate, yet sounds temptingly appetizing.

The book is worth every cent it costs to any doctor, and many times its price to one who undertakes much work with the disorders and diseases of the digestive organs.

FOOD AND PRINCIPLES OF DIETETICS.

By Robert Hutchinson, M.D. Edin. F. R. C. P., London. Third edition; 600 pages. With plates and diagrams, $3 net. New York: William Wood & Company.

This work of Hutchison on Dietetics is based on a course of lectures addressed to the students in the London Hospital about two years ago, and from the very first was accorded an enthusiastic reception. The subject has been so generally neglected in ordinary medical education that the want thereof was recognized, and the ability of the author and his cognizance of the requirements of his classes enabled him to supply a book that at once became an authority whose influence still grows. So rapid, however, have recently been the advances in our knowledge of the physiology and pathology of digestion that the whole book has been twice rewritten and enlarged, resulting in the present complete presentation of the subject.

The book classifies all foods, chiefly according to origin, but gives specific attention to individual members of special importance. Concerning alcohol, used during health, he acknowledges that in a certain sense and in certain amounts it acts as a food, but

believes that its secondary effects counteracts the benefits derived. Moreover, under the most favorable circumstances, "as a food it is eight times dearer than bread." He acknowledges, however, that alcohol, properly used, is beneficial in certain diseases, despite the laboratory tests to the contrary, a conclusion with which many doctors of long experience will agree. His account of the various processes by which different forms of distilled liquors are produced, their different constituents and therapeutic values, and the sources of their flavors, is complete and interesting. Indeed this latter phrase describes the whole book.

THE CARE OF THE BABY.

By J. P. Crozer Griffith, M. D., Clinical Professor of Diseases of Children in the University of Pennsylvania. Fifth revised edition. 12 mo. of 455 pages, illustrated. Philadelphia and London: W. B. Saunders Company; 1911. Cloth, $1.50 net.

This is a manual for mothers and nurses, and the fact that a fifth edition is now demanded goes to show that tens of thousands of those indispensable individuals are anxious to learn how best to care for the units of the rising generation. It is a book of some 450 pages, well illustrated, and, like all of the Saunders books, is finely gotton up in every respect.

The headings of the chapters indicate the "tone" of the book. They are: "Before the Baby Comes," "The Baby," "The Baby's Growth," "The Baby's Clothes," "Feeding the Baby," "Sleep," "Exercise and Training; Physical, Mental and Moral," "The Baby's Nurses," "The Baby's Rooms," "The Sick Baby." And there are two appendices. Examining the chapters thus indicated the reviewer finds that no detail, however minute or apparently unimportant, is omitted or slighted. So clear and comprehensive does the book teach the art of raising babies that the most inexperienced old maids, yea even an old bachelor, so carefully studying its precepts that they could recite them in the dark, would consider themselves qualified to raise babies, the same, of course, to be provided by other people!

Seriously, the book is practical and valuable, and there are few families or nurses that would not be benefited by reading and obeying its suggestions.

A MANUAL OF MATERIA MEDICA FOR MEDICAL STUDENTS.

By E. Quin Thornton, M.D. Assistant Professor of Materia Medica in the Jefferson Medical College, Philadelphia. $3.50 net. Lea & Febiger, Philadelphia and New York; 1911.

It is refreshing to meet a book on materia medica which is "only this and nothing more," which lays no claim to teaching pharmacy, or pharmacology, or therapeutics—just materia medica. Such a book is this, and it maintains the same straightforwardness to the last of its five hundred pages. It was getting time for a new work on materia medica—one that would be fresh and original and not a compilation from previous authorities, or a servile imitation inspired by the same sources.

Thornton's book is truly "different." It contains the names and properties of every drug known to official pharmacy, and of many that have not yet achieved that distinction. Among these is Paradiamidodioxyarsenobenzolum, otherwise known as salvarsan, or "606." The treatment the author accords to this now famous drug is an indication of the brevity that prevails throughout the book. He gives a brief history, the conditions in which it is used, the contraindications, three different methods of preparing and using the dosage, etc., yet the whole article occupies but two pages. If it were dilated on as are some substances in certain textbooks it would fill a chapter. Possibly, however, too great a devotion to brevity and concentration may not suit the needs of students.

In the last part of the book the different substances are again recounted, this time arranged pharmaceutically, as Extracts, Tinctures, Oils, Pulveres, etc. This is particularly convenient for students of pharmacy. The book is one of the best of its class, but appeals to students more than to practicing physicians.

THERAPEUTICS.

OLEUM RICINI.

(*Through a misunderstanding the printer has clothed "Therapeutic Notes" for March in smaller type than was intended.*)

Castor oil is one of the oldest known laxatives which has lost none of its prestige by time, nor been superseded by more recent and palatable rivals. Every physician who is really acquainted with its merits will confess that he wishes to prescribe it much more frequently than he does. Its nauseous taste, odor and "feel" as it is swallowed prohibit its use in a large proportion of cases that would be the better for it.

Several devices have been tried to disguise the taste, but unsuccessfully. The individual dose may be so doctored as to escape recognition by the palate at the instant of swallowing it, but with one or two exceptions the flavor returns to plague the patient. Beer, poured from the bottle, envelops the dose in a mass of frothy bubbles so that it is unrecognizable. The first poured into the glass must be slowly introduced so as to prevent foaming. Then the oil poured upon that without oiling the sides of the glass. Then the beer bottle is held high and the falling stream breaks up the mass of oil and wraps each globule in a bubble of beer. I have seen patients who violently refused to consider taking oil drink a glass of such beer with avidity and declare it the best they ever tasted. Also, by burning the fauces with strong whiskey held in the back of the mouth for a minute or two the sense of taste is obtunded and the dose can be taken. Castor oil is the safest and most reliable laxative, painless in its action, and without irri-

tating effects on the tissues. It has been compared to a broom which sweeps the intestinal tract clean. In large doses, two fluidounces (59.0 cc) it is given with various taenacides to remove the worm while stupefied. In small doses, one fluiddrachm (4.0 cc) once daily it is a remedy for chronic diarrhoea, its secondary effect being constipating.

Such small doses are often sufficient to move the bowels of adults. Especially is this the case with puerperal women immediately after labor. In such cases many physicians administer that amount as a routine practice when leaving the patient to her rest.

In the mucous diarrhoeas of summer, called dysentery, a tablespoonful of oil with ten drops (0.6 cc) of laudanum for an adult, or less for children according to age, is a valuable preliminary treatment.

For children it is the only simple laxtive they should take.

MAGNESII SULPHAS.

Sulphate of magnesia, Epsom salts, is, next to castor oil, probably the laxative or purgative medicine most frequently prescribed. Like oil, it is unirritating, painless, and harmless. Immense doses cause only large discharges from the bowels, while small amounts given at short intervals result in natural, consistent stools.

This effect was once believed to be caused by exosmosis on account of the density of the solution, but the accepted view is that the salts excite additional secretion from the glandular elements and also stimulate peristalsis. In patients who are excessively anaemic, having a very low index of hemoglobin, it is said that instead of being purgative moderate doses of Epsom salts are not effectual.

Acute dysentery is often completely relieved by the following:

R. Magnesii sulphatis.....ounce I (30.0 cc)
Aquae .....fluidounces IV (120.0 cc)
Acidi sulphurici aromaticae..fluidrachms SS (2.0 cc)
Tincturae opii deodorati ..fluidrachms S S (2.0 cc)

Misce. Signa: A tablespoonful every half hour until actions become watery and free.

It also constitutes an efficient enema, as follows:

R. Magnesii Sulphatis.....ounces II (60.0 gm)
Olei Terebinthinae .....fluidrachms IV (15.0 cc)
Glycerini .....fluidounce I (30.0 cc)
Aquae.....q. s. ad fluidounces IV (120.0 cc)

Misce. Signa: To be injected at one dose.

In the treatment of diseases complicated with large effusions of serum into the cavities or into the tissues, the weight and pressure of the effused fluid is often the cause of more discomfort or even danger than is immediately the case with the disease that causes it. In such instances, or whenever it is desired to remove the effusion without surgical interference, Epsom salts is the safest and most efficient agent to use. The patient should take half an ounce, dissolved in a glass of water, upon waking in the morning. This dose should be repeated every hour until the amount of serum necessary to relieve him has passed from the rectum. The writer has seen two gallons thus purged from a patient at one morning's effort without apparently causing any loss of strength whatever. Indeed patients will often declare after such relief that they feel stronger than before they took the salts. This, no doubt, is because having gotten rid of some fifteen pounds or more of weight which they had been carrying about with them they felt less hampered in their movements.

TREATMENT OF ECLAMPSIA.

(J. H. Hilden, M.D., *Charlotte Medical Journal*, January, 1912.)

Treatment.—Now, having accepted the view that eclampsia is the fulminating storm of a general toxemia, and that the pathological lesions in the various organs are only local manifestations of a general disturbance, I urge that no symptomatic treatment in eclampsia should be adopted without due consideration of these facts. To simply control convulsions by the shortest and easiest methods with little or no regard to the real nature of the trouble, or to its progressively degenerate lesions, is to my mind utterly irrational. Controlling convulsions is, indeed, important, but while doing so such measures should be taken as furnish nature the most potent aid in her efforts of elimination. Many cases call for immediate delivery, and under such conditions ether serves a double purpose. For controlling convulsions, relieving vascular tension and furnishing a sedative to the motor areas we have potent remedies in the hypodermic use of moderate doses of morphine and veratrum, and in some cases, occasional doses of nitroglycerine. To this list might be added chloral hydrate and the bromides with benefit. For relieving the kidneys and removing toxic products normal salt solutions, given either subcutaneously or by the drop method from the bowel, may be often helpful. Here, also, diuretics and purgatives, such as calomel, castor oil, the salines, and also the hot pack should not be forgotten. In plethoric patients in which it seems advisable to bleed, the normal salt solutions following venesection are doubly indicated.

In conclusion, I wish to say, by observing such measures as have been recommended the maternal mortality in my last eleven cases of puerperal eclampsia has been nothing.

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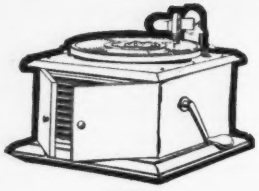

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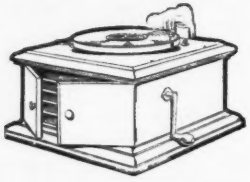

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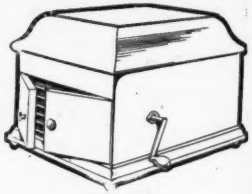

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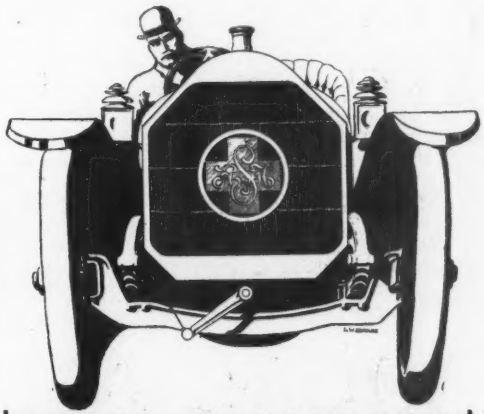

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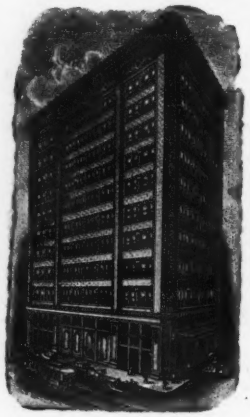

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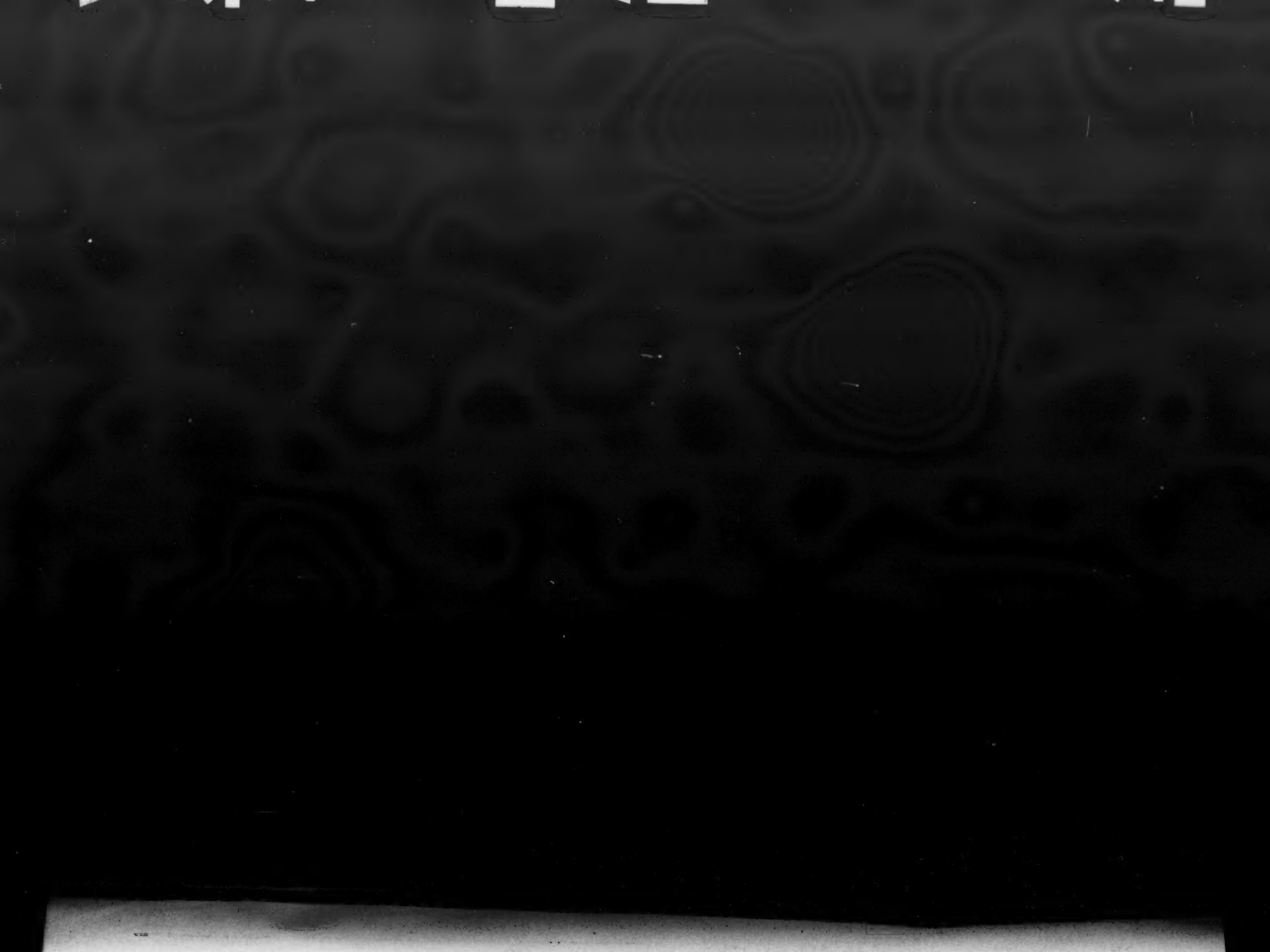

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PITMAN-MYERS CO., Chemists, 111 No. Capitol Avenue, Indianapolis, Ind.

The Largest, Best Equipped and Most Sanitary Plant of Its Kind in the World.

The Home of the Original and Only Genuine

HORLICK'S MALTED MILK

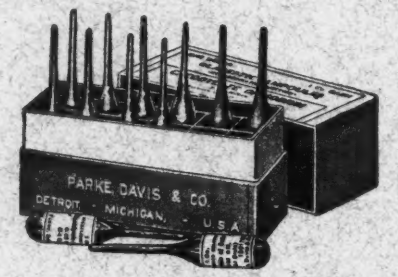
Samples sent on request. **RACINE, WIS., U. S. A.**

Sterilized Solutions in Glaseptic Ampoules

(FOR HYPODERMATIC USE.)

No.

1. **Adrenalin Chloride Solution,** B 1 (1:10,000). 1 Cc. ampoules.
2. **Adrenalin Chloride Solution,** B 2 (1:1000). 1 Cc. ampoules.
3. **Caffeine and Sodium Benzoate,** 0.5 Gm. (7½ grains): Equivalent to 0.25 Gm. (3¾ grains) Caffeine and an equal quantity of Sodium Benzoate. 2 Cc. ampoules.
4. **Camphor in Oil,** 0.2 Gm. (3 grains). 2 Cc. ampoules.



5. **Codrenin,** B "C": Adrenalin Chloride, 0.0001 Gm. (1:10,000); Cocaine Hydrochloride, 0.0025 Gm. (¼ of 1%). 1 Cc. ampoules.

   Ergot Aseptic (equivalent to 30 grains Ergot). 1 Cc. ampoules.
6. **Eudrenin,** B "B": Adrenalin Chloride, 0.0001 Gm. (1:10,000); Beta Eucaine Hydrochloride, 0.0025 Gm. (¼ of 1%). 1 Cc. ampoules.
7. **Iron Citrate (Green),** 0.13 Gm. (2 grains): Iron and Ammonium Citrate (Green), 0.13 Gm. (2 grains); Quinine and Urea Hydrochloride (as a local anesthetic), 0.005 Gm. (½ of 1%). 1 Cc. ampoules.
8. **Iron Arsenite,** 0.065 Gm. (1 grain): Iron Arsenite with Ammonium Citrate. 1 Cc. ampoules.

No.

9. **Iron Arsenite and Strychnine:** Iron Arsenite with Ammonium Citrate, 0.065 Gm. (1 grain); Strychnine Nitrate, 0.001 Gm. (1-65 grain). 1 Cc. ampoules.
10. **Mercuric Iodide, Red, 1% (Aqueous):** Mercuric Iodide, Red, 1% (1-6 grain); Soluble Salt of Para-amido-ethyl-benzoate (as a local anesthetic), 1% (1-6 grain); Potassium Iodide, 1% (1-6 grain); Distilled Water, q. s. 1 Cc. ampoules.
12. **Morphine and Atropine,** B "A": Morphine Sulphate, 0.016 Gm. (¼ grain); Atropine Sulphate, 0.0006 Gm. (1-100 grain). 1 Cc. ampoules.
13. **Morphine and Atropine,** B "B": Morphine Sulphate, 0 008 Gm. (⅛ grain); Atropine Sulphate, 0.0003 Gm. (1-200 grain). 1 Cc. ampoules.
14. **Morphine and Hyoscine:** Morphine Hydrobromide, 0.01 Gm. (1-6 grain); Hyoscine Hydrobromide, true, 0.0004 Gm. (1-150 grain). 1 Cc. ampoules.
15. **Pilocarpine Nitrate,** 0.02 Gm. (⅓ grain). 1 Cc. ampoules.
16. **Pituitrin.** 1 Cc. ampoules.
17. **Quinine and Urea Hydrochloride, 1%.** 5 Cc. ampoules.
18. **Quinine Dihydrochloride,** 0.25 Gm. (3¾ grains). 1 Cc. ampoules.
20. **Sodium Cacodylate, ¾ Grain.** 1 Cc. ampoules.
21. **Sodium Cacodylate, 2 Grains.** 1 Cc. ampoules.
22. **Sodium Cacodylate, 3 Grains.** 1 Cc. ampoules.
23. **Sodium Cacodylate, 7 Grains.** 1½ Cc. ampoules.
24. **Strophanthone, Dilute:** Strophanthone, 8 minims, diluted to 1 Cc. by normal saline solution. 1 Cc. ampoules.

These solutions are aseptic; they are permanent; they are always ready for use.

Home Offices and Laboratories,
Detroit, Michigan.

PARKE, DAVIS & CO.